1992 PPRC 1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC

PHYSICIAN
PAYMENT
REVIEW
COMMISSION

FEE UPDATE AND MEDICARE VOLUME PERFORMANCE STANDARDS FOR 1993

No. 92-4

1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC 1992 PPRC
1992 PPRC 1992 PPRC 1992 PPRC

R
728.5
.U527b
1993

PHYSICIAN PAYMENT REVIEW COMMISSION

FEE UPDATE AND MEDICARE VOLUME PERFORMANCE STANDARDS FOR 1993

No. 92-4

June 1992

2120 L Street, NW
Suite 510
Washington, DC 20037
(202) 653-7220
FAX (202) 653-7238

PREFACE

This report was submitted to Congress in accordance with the Commission's responsibility under the Omnibus Budget Reconciliation Act of 1989 to comment on the recommendations of the Secretary of Health and Human Services and to submit the Commission's own recommendations on updating fees and setting the Volume Performance Standard rate of increase for physician expenditures under Medicare Part B.

Donald F. Cox, Ph.D., was the Commission staff member principally responsible for the preparation in this report. Christopher Hogan, Ph.D., and Jennifer Smith provided important contributions.

COMMISSION MEMBERS

Philip R. Lee, M.D., Chairman
Director, Institute for Health Policy Studies
University of California
San Francisco, CA

Linda H. Aiken, Ph.D.
Director, Center for Health Services and Policy Research
University of Pennsylvania
Philadelphia, PA

Drew E. Altman, Ph.D.
President
The Henry J. Kaiser Family Foundation
Menlo Park, CA

Richard V. (Dick) Anderson
Vice President and Director of Medical Economics and Statistics
Kaiser Foundation Health Plan
Oakland, CA

P. William Curreri, M.D.
President
Strategem of Alabama, Inc.
Mobile, AL

Karen Davis, Ph.D.
Professor and Chairman
Department of Health Policy and Management
The Johns Hopkins University
Baltimore, MD

John M. Eisenberg, M.D., M.B.A.
Professor and Chairman
Department of Medicine
Georgetown University Medical Center
Washington, DC

Jack Guildroy
Port Washington, NY

Robert B. Keller, M.D.
Private Practice of Medicine and Executive Director
Maine Medical Assessment Foundation
Belfast, ME

Michael D. McKinney, M.D.
Private Practice of Medicine
Centerville, TX

Patricia M. Nazemetz
Director of Benefits
Xerox Corporation
Stamford, CT

Thomas R. Reardon, M.D.
Private Practice of Medicine
Portland, OR

Uwe Reinhardt, Ph.D.
James Madison Professor of Political Economy
Woodrow Wilson School
Princeton University
Princeton, NJ

COMMISSION STAFF

Paul B. Ginsburg, Ph.D., Executive Director
Lauren B. LeRoy, Ph.D., Deputy Director

Principal Policy Analysts

David C. Colby, Ph.D.
Roz Diane Lasker, M.D.

Senior Analysts

Donald Cox, Ph.D.
John F. Hoadley, Ph.D.
Christopher Hogan, Ph.D.
Katie Merrell
Nguyen X. Nguyen, Ph.D.
Anne Schwartz
David W. Shapiro, M.D., J.D.

Analysts

Anthony M. Tucker, M.P.A.
Susan Wall

Junior Analyst

Jennifer I. Smith

Visiting Scholar

Ernest Moy, M.D., M.P.H., Columbia University [1]

Administrative Staff

Sheran Estes McManus
Annette B. Hennessey
Ann Johnson
Joyce Malones
Faye Outten-Kirk

---

[1] Robert Wood Johnson Faculty Fellow in Health Care Finance.

Preface i
Commission Members iii
Commission Staff iv
Executive Summary vii
The Commission's Report 1
  Background 1
  1993 Conversion Factor Update Recommendations 3
  Volume Performance Standard Recommendations for Fiscal Year 1993 10
  Comments on the Secretary's Recommendations 14
  Modifications of the VPS Decision-Making Process 14
  Refining the Structure of the VPS 16

Appendixes

A Trends in Expenditures, Prices, and Volume 17
B Appropriateness and Access 23
C Technological Change 31

Tables

1 History of Performance Standards and Conversion Factor Updates 4
2 Conversion Factor Update Recommendations for 1993 7
3 Volume Performance Standard Recommendations for 1993 10
A-1 Trends in Outlays, Price, and Volume Growth: By Procedure Type, 1986-1990 18
A-2 Trends in Outlays, Price, and Volume Growth: By Physician Specialty, 1986-1990 20
A-3 Trends in Outlays, Price, and Volume Growth: Surgical and Nonsurgical Services, 1986-1990 22
B-1 Allowed Charges for Physicians' Services: Ratio of Medicare to Blue Shield Plans, 1986-1990 28
B-2 Allowed Charges for Physicians' Services: Ratio of Medicare to Blue Shield Plans and Private Insurers, Selected Years 29
B-3 Physicians' Services: Medicare and Blue Shield Plan Volume Per Enrollee, 1988-1990 30
C-1 Trends in New Technology Growth: 1986-1990 36
C-2 Trends in New Technology Growth: By Physician Specialty, 1986-1990 39
C-3 Trends in New Technologies: Number of MRIs per Thousand Enrolless, By State, 1986-1990 40
C-4 Trends in New Technologies: Number of CAT Scans per Thousand Enrollees, By State, 1986-1990 42
C-5 Trends in New Technologies: Number of Endoscopies per Thousand Enrollees, By State, 1986-1990 43

References 47

EXECUTIVE SUMMARY

Each year, as specified by the Omnibus Budget Reconciliation Act of 1989 (OBRA89), the Commission comments on the recommendations of the Secretary of Health and Human Services (HHS) regarding the Medicare Volume Performance Standards (VPS) and makes its own recommendations. This report presents the Commission's recommendations on the Medicare Fee Schedule conversion factor update for calendar year 1993 and the performance standard for fiscal year 1993. It includes comments on the HHS report and recommendations for improving the VPS decision-making process.

CONVERSION FACTOR UPDATE RECOMMENDATIONS

OBRA89 provides a default mechanism for determining the conversion factor update if no congressional action is taken. According to this formula, the update is equal to the percentage change in the Medicare Economic Index (MEI) adjusted for the amount by which actual outlays exceed (or are less than) the VPS, and any other statutory adjustments. Separate updates for surgical and nonsurgical services are specified.

The Commission supports using the default formula to determine the overall update. Under the latest projections by the Medicare Actuary, this will be 0.9 percent (the MEI of 2.2 percent less the 1.3 percentage points by which 1991 expenditures exceeded the performance standard for that year).

The Commission recommends a partial departure from the default formula for updating the surgical and nonsurgical conversion factors. Applying the default formula would increase the surgical conversion factor by 2.6 percent and the nonsurgical conversion factor by 0.3 percent. It has two problems with the default formula. First, it questions the accuracy with which the two performance standards were set in 1990. The differential is highly dependent on assumptions about physician behavioral response to fee cuts that took effect during fiscal year 1991. Second, the Commission is concerned about introducing distortions into the relative value scale. On the other hand, the Congress did make a decision to have performance standards for 1991, which implies having differential updates for 1993.

The Commission recommends that the conversion factors be updated for 1993 on the basis of the default formula, but that the differential not be incorporated into the baseline for determining payment rates in future years. In order for this not to affect the budget, the baseline for the 1994 update would be the 1992 conversion factor increased by the overall default update of 0.9 percent. The Commission plans additional analysis of 1991 expenditure increases that, if conclusive, would lead to a subsequent recommendation for revision in the updates derived from the default formula.

VOLUME PERFORMANCE STANDARD RECOMMENDATIONS

Given the difficulties in setting separate standards and the risk of distorting the incentives that payment reform was intended to create, the Commission continues to favor both a single performance standard and a single update for all services. The Commission's recommendation for the overall 1993 Volume Performance Standard is based on: (1) full allowances for expenditure growth due to increases in fees, growth and aging of the beneficiary population, and the effects of prior legislation, and (2) a 3.0 percentage point reduction from the Actuary's baseline projection of volume growth. Based on current estimates of each of these factors, the overall performance standard would be 8.9 percent. This is lower than the default performance standard of 11.0 percent.

In determining its recommendation, the Commission again followed the principle of reducing the rate of growth in expenditures for physicians' services to the rate of growth in gross domestic product (GDP) by 1996. For 1991, the Commission recommended a 2.0 percentage point reduction from projected baseline volume growth to move toward this goal. For 1992, it recommended a 2.5 percentage point reduction. Continuing on this path, the Commission recommends a 3.0 percentage point reduction for 1993.

COMMENTS ON THE SECRETARY'S RECOMMENDATIONS

On May 21, 1992, the Secretary submitted recommendations to Congress on the conversion factor update and Volume Performance Standard for 1993. For the update, the Secretary recommended the default values of 2.6 percent for surgical services and 0.3 percent for nonsurgical services. As discussed above, the Commission agrees provisionally with the amounts but recommends that they apply only to 1993 and not enter the base for determining the conversion factor in later years.

For the Volume Performance Standard, the Secretary recommends an overall standard of 7.3 percent, a 6.0 percent standard for surgical services and a 7.9 percent standard for nonsurgical services. Compared to the Medicare Actuary's baseline of 12.1 percent, the Secretary's overall recommendation is 4.5 percentage points lower, which the Commission considers to be an excessive reduction. The Commission's recommendation of 8.9 percent reflects a 3.0 percentage point reduction in volume growth to continue on a path toward reducing the expenditure growth rate to the growth rate of GDP by 1996.

MODIFICATIONS OF THE VPS DECISION-MAKING PROCESS

This year, the VPS decision-making process was unnecessarily complicated by delays in obtaining necessary information. To avoid this problem in the future, the Commission makes two recommendations.

First, the Secretary should be required to make two reports to Congress: one containing the data needed to make decisions on updates and performance standards, due by March 15; the other transmitting the Secretary's recommendations, due on April 15.

Second, the quarterly reporting required under OBRA87 should be revised so that data on physicians' services are provided monthly in a format that presents expenditure and volume data at the level of detail required to assess performance under the VPS.

This report presents the Commission's recommendations for the calendar year 1993 conversion factor update and the fiscal year 1993 Volume Performance Standard (VPS). The first section contains a discussion of the legislative requirements and a summary of past conversion factor updates and Volume Performance Standards. The second section presents the Commission's conversion factor update recommendations. The Commission's Volume Performance Standard recommendations are given in the third section. This is followed by the Commission's comments on the recommendations of the Secretary of Health and Human Services (HHS). The last two sections deal with recommendations to improve the annual VPS decision-making process and a progress report on the Commission's work on subnational volume performance standards. Analyses of trends in outlays, prices and volume, appropriateness and access, and technology are then presented in appendixes.

BACKGROUND

Under Volume Performance Standards, a target rate of increase in spending for physicians' services is specified. The comparison of actual rates of increase in spending with the standard is a major factor in setting future fee updates.

The VPS mechanism has two key purposes. First, it provides a tool for budgeting. The size of outlay increases is debated in advance; increases that differ from the decision can be offset through subsequent adjustments of fee updates. Second, by directly linking fee schedule conversion factor updates to how much actual outlays exceed or fall short of the standards, it provides an incentive mechanism for cost containment. Physicians will receive higher increases in per-service fees if the actual growth in outlays is less than the performance standard. Conversely, physicians will receive lower increases if actual outlay growth exceeds the standard.

The Annual VPS Process

The Omnibus Budget Reconciliation Act of 1989 (OBRA89) requires the Secretary to recommend conversion factor updates and VPS rates of increase by April 15th of each year. OBRA89 also requires the Commission to review the Secretary's recommendations, comment on those recommendations, and make its own recommendations to the Congress by May 15th. The Congress can then act to set the conversion factor update and/or the VPS or allow a default formula to take effect.

The conversion factor is a monetary multiplier that converts the relative values for physicians' services into payment amounts. The 1992 conversion factor is $31.00 and applies to all services. The conversion factor update for 1993 is determined in part by comparing the actual increase in outlays for 1991 with the 1991 VPS. The difference is then subtracted from a forecast of the increase in the Medicare Economic Index (MEI). Various factors such as changes in the volume and intensity of services, changes in access, and other statutory adjustments are then considered to obtain the final conversion factor update recommendation.

OBRA89 provides a default mechanism for determining the conversion factor update if no congressional action is taken. According to this formula, the update is equal to the percentage change in the MEI adjusted for:

- the amount by which actual outlays exceed (or are less than) the VPS, and
- any other statutory adjustments.[1]

OBRA90 calls for separate conversion factor updates for surgical and nonsurgical services, but the updates can be the same amount. Definitions of surgical and nonsurgical services were developed through regulation. For the performance standard, surgical services are those that are both classified by Current Procedural Terminology (CPT) as surgery and are performed by surgeons. This definition excludes surgeries performed by nonsurgeons as well as nonsurgical procedures and evaluation and management services, that are performed by surgeons. Updates for surgical services apply to all surgeries, regardless of who performs them.[2] If the default mechanism is used for determining the 1993 updates, there will be different surgical and nonsurgical updates.

OBRA89 specifies that the following factors be considered for setting the performance standard:

- inflation,
- growth and aging of the beneficiary population,
- evidence of barriers to access,
- evidence of inappropriate utilization,

---

[1] For example, the conversion factor update for 1992 included an OBRA90 mandated 0.4 percentage point reduction from the MEI baseline.

[2] An important consideration in the development of these definitions was the provision of OBRA89 specifying that there be no specialty differentials.

- effects of changes in technology, and
- other factors (e.g., changes in legislation).

As with the conversion factor update, OBRA89 provides a default mechanism for setting the performance standards. Under this mechanism, the performance standards would be determined by the product of the following factors minus a "performance standard factor":

- the percentage increase in Part B enrollees (excluding risk HMO enrollees) between the past and current fiscal years,
- the weighted average percentage increase in fees for physician services for the calendar year months contained in the current fiscal year,
- the average annualized rate of growth in volume and intensity of physician services for the last five fiscal years, and
- the percentage increase in expenditures resulting from changes in law and regulations.

Beginning with the VPS for 1993, the performance standard factor for default calculations is 2.0 percentage points.

Previous Recommendations and Actions

This year marks the third year in which the Secretary and the Commission are to make recommendations in compliance with the OBRA89 requirements. For the past two years there have been differences both between the Secretary's and the Commission's recommendations, and between those and the final versions published in the *Federal Register* (Table 1). These differences are briefly summarized below.

VPS Rate of Increase Recommendations. In both years, the Secretary's recommendation for the VPS began with a baseline that combines the four factors specified in the OBRA89 default formula: beneficiary growth and aging, inflation, changes in law and regulation, and the historical rate of growth in volume and intensity. For the 1991 VPS, this baseline was 13.6 percent; the Secretary's recommendation of 9.9 percent was based on a full allowance for the first three factors and an allowance for one half of the fourth factor. Based on different impacts of law and regulation, the recommended performance standards were 8.7 percent for surgical services and 10.5 percent for nonsurgical services. The differential included estimates by the Medicare Actuary of both the effects of price reductions from OBRA89 and OBRA90 and the responses to these changes by physicians. No differential in baseline growth in volume and intensity was assumed.

Table 1. History of Performance Standards and Conversion Factor Updates

	PERFORMANCE STANDARD			UPDATE
YEAR	Total	Surgical	Non-Surgical	Total
1990				
Final	9.1	NR	NR	NR
1991				
HHS	9.9	8.7	10.5	NR
PPRC	11.2	9.3	12.1	NR
Final	7.3	3.3	8.6	NR
1992				
HHS	6.2	4.1	7.1	2.2
PPRC	8.6	6.6	9.6	2.2
Final	10.0	6.5	11.2	1.9

Notes: NR = Not required.

Changes in the baseline between the time the recommendations were made and the time the final standard was set explain some of the discrepancies between recommendations and final standards.

The Commission's approach has been to start with the Medicare Actuary's baseline projection of increases in expenditures and to choose a factor to subtract from the volume and intensity component of the projection.[3] For 1991, the Commission recommended a factor of 2.0 percentage points (1.0 percentage point more than the default performance standard factor for that year), which, in the Commission's judgment, was the largest feasible reduction in volume that was consistent with its long term goal of reducing the rate of growth in outlays to the nominal rate of growth in gross national product (GNP) by 1996.[4] With the Actuary's baseline of 13.2 percent, a 2.0 percentage point factor implied a VPS recommendation of 11.2 percent.

The Commission's VPS recommendations for surgical and nonsurgical services were 9.3 percent and 12.1 percent, respectively. These were 1.0 percentage point farther apart than the Secretary's, reflecting the Commission's analysis that surgical services were growing more slowly than nonsurgical services and an assumption that this difference would continue through 1991.

---

[3] The difference between the Medicare Actuary's projection and the baseline used by the Secretary is that the latter uses an extrapolation of a five-year moving average rate of growth in volume and intensity (specified for the default formula) for that component while the former is based on the Actuary's best judgment.

[4] It should be noted that this year, the Commission adjusted this goal by switching from GNP to GDP to define the 1996 target.

The Congress acted to set the VPS for 1991. In Section 4105 of OBRA90 it instructed the Secretary to set the VPS as the sum of:

> *(i)* *the Secretary's estimate of the percentage by which actual expenditures for the category of physicians' services under this part for fiscal year 1991 exceed actual expenditures for such category of services in fiscal year 1990 (determined without regard to the amendments made by the Omnibus Budget Reconciliation Act of 1990), and*
>
> *(ii)* *the Secretary's estimate of the percentage increase or decrease in expenditures for the category of services in fiscal year 1991 (compared with fiscal year 1990) that will result from changes in law and regulations (including the Omnibus Budget Reconciliation Act of 1990), reduced by 2 percentage points.*

These instructions followed the Commission's recommendation. The Congress did not, however, follow the Commission's recommendation to include an additional spread between the surgical and nonsurgical performance standards.

Due to substantial price reductions brought about by other provisions of OBRA90, the final performance standards published in the *Federal Register* were considerably lower than those initially recommended by either the Secretary or the Commission.[5] The standards were 3.3 percent for surgical services, 8.6 percent for nonsurgical services, and 7.3 percent for all services.

For the 1992 VPS recommendations, the Secretary used the same methodology as for 1991. Allowances for beneficiary growth and aging, changes in law and regulation, inflation, and for one half of the historical trend in volume and intensity yielded a recommendation of 6.2 percent overall, 4.1 percent for surgical services, and 7.1 percent for nonsurgical services.

The Commission also followed its prior methodology. It recommended a performance standard factor of 2.5 percentage points (1.0 percentage point more than the default factor), leading to a VPS of 8.6 percent overall, 6.8 percent for surgical services, and 9.6 percent for nonsurgical services.

---

[5] Both the Secretary and the Commission assumed that their VPS recommended numbers would be subsequently revised to reflect the effects of laws and regulations enacted later in the year and technical reestimates by the Actuary.

Congress did not act to set the performance standards for 1992, so they were determined by the default formula. The final standards published in the *Federal Register* were 10.0 percent for all services, 6.5 percent for surgical services only, and 11.2 percent for nonsurgical services.

Conversion Factor Update. The VPS mechanism was used for the first time in determining fee updates in 1992. Both the Secretary and Commission recommended following the default formula for the update. The expenditure increase for 1990 was 10.6 percent, exceeding the final standard of 9.1 percent. The difference was subtracted from the MEI (4.1 percent), as was an additional 0.4 percentage points mandated by OBRA90, to obtain an update of 2.2 percent.

Since Congress did not act, the default formula also determined the actual update factor. Reestimates of expenditure growth and the MEI resulted in a final update of 1.9 percent.

CONVERSION FACTOR UPDATE RECOMMENDATIONS FOR 1993

This section describes the Commission's recommendations on both the overall update in the conversion factor and updates for the separate categories of surgical and nonsurgical services.

Overall Conversion Factor Update

The Commission believes that, in most instances, the conversion factor update should be the MEI plus or minus the difference between the actual expenditure increase and the performance standard. Using such a formula strengthens incentives to contain costs and enhances the ability to budget. The default formula for the update reflects this reasoning.

As was the case for the 1992 update, the Commission sees no reason to depart from the default formula for the overall update for 1993. Estimates from the Medicare Actuary indicate that 1991 expenditures for physicians' services increased by 8.6 percent, compared to the performance standard of 7.3 percent. Since the MEI is projected to be 2.2 percent, the overall default conversion factor update will be 0.9 percent (Table 2).[6]

---

[6] It should be noted that by the time the final update is published in the *Federal Register*, the default estimate may change as more complete data on 1991 expenditures and a revised projection of the MEI become available.

Table 2. Conversion Factor Update Recommendations for 1993

	PPRC			HHS		
	All	Surgery	Non-Surgery	All	Surgery	Non-Surgery
Medicare Economic Index (MEI)	2.2	2.2	2.2	2.2	2.2	2.2
1991 VPS	7.3	3.3	8.6	7.3	3.3	8.6
1991 Expenditure Growth	8.6	2.9	10.5	8.6	2.9	10.5
VPS Less Expenditure Growth	-1.3	0.4	-1.9	-1.3	0.4	-1.9
Recommended Update	**0.9**	**2.6**	**0.3**	**0.9**	**2.6**	**0.3**

Surgical and Nonsurgical Service Conversion Factor Updates

This year presented the second opportunity to make recommendations for surgical and nonsurgical service conversion factor updates. Last year, because only one standard was set for 1990, both the Secretary and the Commission opted not to make separate surgical and nonsurgical update recommendations.

This time, the update will be based in part on the 1991 VPS, which included separate surgical and nonsurgical standards. If the default mechanism is used this year, separate surgical and nonsurgical conversion factor updates will result.

Estimates by the Actuary indicate that actual 1991 expenditures for surgical services increased by 2.9 percent compared to a performance standard of 3.3 percent. Estimated 1991 expenditures for nonsurgical services increased 10.5 percent compared to a performance standard of 8.6 percent. Using a projected MEI of 2.2 percent, the default conversion factor updates for calendar year 1993 would be 2.6 percent for surgical services and 0.3 percent for nonsurgical services.

Some have looked at the respective rates of increase in *expenditures* of 2.9 percent and 10.5 percent and mistakenly concluded that *volume* of surgical services has increased much more slowly than volume of nonsurgical services. But analysis of data provided by the Medicare Actuary shows that volume increases for 1991 were virtually identical. The differences in expenditure increases are due almost entirely to changes in Medicare payment rates -- a reduction for surgical services and an increase for nonsurgical services. As a result of assumptions about behavioral offsets, the 1991 performance standards provided for a higher volume increase for surgical services than for nonsurgical services. When volume increased at the same rate, the performance of surgical services was judged superior to that of nonsurgical services and a higher update is thus prescribed by the default formula.

The Commission's recommendation is for a differential update for 1993 that would affect payment rates for 1993 only and not be incorporated into the baseline for determining payment rates in future years. In order for this not to affect the budget, the conversion factor update incorporated into the baseline would be the overall update of 0.9 percent. The Congress could specify the baseline for the conversion factor for 1994 and later years in legislation setting the 1993 update. Should there be no legislation this year, however, the Congress will have another opportunity to do this next year in legislation setting the 1994 update. The Commission supports the differential update because the Congress set such a policy in OBRA90. At the same time, the Commission recommends that the separate updates affect only 1993 payment amounts because of both technical concerns regarding accuracy of the 1991 performance standards and reluctance to introduce permanent distortions into the relative value scale.

Two distinct technical problems in setting the 1991 standards concern the Commission: (1) the inability to define separate baseline trends in volume and intensity for surgical and nonsurgical services, and (2) the imprecision of assumptions made by the Actuary concerning behavioral responses to fee reductions and which services they would affect. In the course of analyzing historical trends two years ago, the Commission projected that apart from any responses to Volume Performance Standards, the volume and intensity of surgical services was likely to grow more slowly than that of nonsurgical services (PPRC 1990b). Without recognition of this difference in baseline rates of growth, some of the apparent differential in performance could be mistakenly attributed to response to the VPS.

In setting the performance standards, the Actuary must make assumptions about physician responses to changes in fees, in terms of both their magnitude and assignment to the surgical or nonsurgical category. Behavioral offset assumptions affect the assessment of differential performance because they are built directly into the performance standards. If, for example, surgical fees are cut by 1 percent and the Actuary assumes a 50 percent offset, then the Actuary's factor for the effects of legislation and regulation will be a reduction of 0.5 percentage points rather than a reduction of 1 percentage point.

But these assumptions are necessarily highly imprecise. Not only is there uncertainty about the correct magnitude, but since the surgical category as defined in regulation excludes technical procedures and visits provided by surgeons, a judgment concerning what proportion of behavioral response by surgeons is expressed in the nonsurgical category is critical.

The general imprecision is important because the fee cuts from OBRA89 and OBRA90 for which the Actuary is calculating a behavioral offset disproportionately affected surgical services. Thus if the assumption of a 50 percent offset is too large, then the differential between the surgical and nonsurgical performance standards will be too small.

The possibility that a substantial portion of surgeons' responses to cuts in fees for surgical services would occur in the nonsurgical category has empirical support. The Commission's analysis of OBRA87 overvalued procedure cuts did not find an induced change in volume of the overvalued procedures themselves, but it did find an induced change in the specialty's overall billing to Medicare (PPRC 1991a).[7] The magnitude of the estimated relationship varied greatly by specialty and could not be estimated with precision. While the Actuary appears to have assumed that some of the response to reductions in surgical fees would affect nonsurgical services by surgeons, most of the behavioral response was allocated to surgery.[8]

With Medicare Part B Administrative Data (BMAD) files for 1991 just now available for analysis, the Commission has the opportunity to assess retrospectively the accuracy of the assumptions about behavioral offsets and their allocation to categories of services. Should this analysis suggest that the surgical and nonsurgical performance standards for 1991 were distorted by imprecise assumptions concerning physician behavior, the Commission will recommend to the Congress updates for surgical and nonsurgical services that differ from the respective default values of 2.6 percent and 0.3 percent.

Aside from the technical problems discussed above, the Commission recommends that the differential updates affect only the 1993 conversion factor out of concern about distortions in relative values. Some who advocate separate standards for categories of service contend that differential updates will tend to cancel out over time. The Commission does not share this confidence, however. Noting the dynamics of changing medical practice and the difficulties of incorporating these changes into differentials for standards, it is quite conceivable that differential updates will cumulate over time. This risks major setbacks in the accomplishments of physician payment reform in rationalizing the pattern of relative payments.

---

[7] A study by Rice (1984) found general substantiation for the existence of spillover effects. This study analyzed the effects of fee cuts for medical services. The results indicated induced changes in the volume of both medical and surgical services.

[8] It is the Commission's understanding that the Actuary assumed a 50 percent offset to surgical fee cuts would apply to surgical services and an unspecified additional offset would apply to nonsurgical procedures and visits provided by surgeons.

VOLUME PERFORMANCE STANDARD RECOMMENDATIONS FOR FISCAL YEAR 1993

Given the difficulties in setting separate standards with precision and the risk of distorting the incentives that payment reform was intended to create, the Commission continues to favor both a single performance standard and a subsequent single update for all services. For 1993, the Commission recommends a single performance standard of 8.9 percent to apply to all physicians' services.

Basis for Recommendation

OBRA89 specifies that inflation, growth and aging of the beneficiary population, the effects of changes in law and regulation, evidence on barriers to access, evidence on inappropriate utilization, and the effects of changes in technology should be considered in formulating the Volume Performance Standards. The first three factors are relatively straightforward to measure, and the Commission uses estimates provided by the Actuary in developing its VPS recommendation (Table 3). The last three factors are not only more difficult to measure, but their relationship to the performance standard is much more complex.

Table 3. Volume Performance Standard Recommendations for 1993

	PPRC	HHS			DEFAULT		
	All	All	Surgery	Non-Surgery	All	Surgery	Non-Surgery
Inflation	2.7	2.7	2.6	2.7	2.7	2.6	2.7
Enrollment	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Aging	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume and Intensity	5.1	3.7	3.7	3.7	9.2	9.2	9.2
Law and Regulation	-0.7	-0.7	-1.9	-0.2	-0.7	-1.9	-0.2
Performance Adjustment Factor	---	---	---	---	-2.0	-2.0	-2.0
Total VPS	**8.9**	**7.3**	**6.0**	**7.9**	**11.0**	**9.6**	**11.6**

Notes: These recommendations would need to be revised should additional changes in law and regulation take place.

Columns do not add exactly because of rounding and compounding.

Existing measurements of rates of inappropriate care apply to specific procedures rather than to aggregate use of services (see Appendix B). Even if a reliable estimate of the proportion of Medicare services that are inappropriate was available, there would not be a straightforward quantitative relationship with the performance standard as there is for growth in the number of Medicare beneficiaries.

Measuring access to care by Medicare beneficiaries is just beginning. In preparation for measurement of changes in access associated with implementation of the Medicare Fee Schedule, the Commission has identified differences in access between certain vulnerable populations and other Medicare beneficiaries (PPRC 1992b). The implications of these findings for setting performance standards are not clear.

Establishing a relationship between technological change and the performance standard is also difficult. As a first step, the Commission obtained information from specialty societies on new technologies whose frequency of use has changed or is expected to change. Using this set of procedures, Commission staff estimated that roughly 14 percent of the average annual growth in volume from 1986 through 1990 was attributable to these new and diffusing technologies, with the impact being slightly higher between 1989 and 1990 (see Appendix C). But these estimates likely miss volume growth that reflects new applications of well-established technologies and the effects of these technologies on other services. The Commission will continue its work on technology in order to gain a better understanding of the role it plays in volume growth.

In developing its recommendation for a 1993 performance standard of 8.9 percent, the Commission made full allowances for expenditure growth due to increases in fees, growth and aging of the beneficiary population, and the effects of prior legislation (Table 3). To determine the allowance for volume and intensity, the Commission again followed the principle of gradually reducing the rate of growth in expenditures for physicians' services to the rate of increase in gross domestic product (GDP) by 1996. This principle was based on the affordability of additional increases in Medicare outlays to taxpayers and beneficiaries (see PPRC 1990b).

Using the Congressional Budget Office (CBO) forecast of 1996 GDP growth of 5.9 percent, this suggests that annual growth in volume of services be reduced to 4.2 percent per year by 1996.[9] When compared to the 8.5 percent average growth rate for 1986 through 1990, this suggests a reduction in the rate of increase of volume of slightly more than 4 percentage points.

---

[9] The Commission selected 1996 as the long-run target date because this date both allows for complete transition to the Medicare Fee Schedule and permits physicians sufficient time to adopt tools for reducing the rate of volume growth for unnecessary services. The 4.2 percent volume target was obtained by first increasing CBO's projected 5.9 percent rate of growth in Gross Domestic Product for 1995-1996 by an estimated 0.6 percent excess rate of increase in the Medicare beneficiary population relative to the entire U.S. population (1.059 x 1.006 = 1.065). This growth rate (6.5 percent) was then deflated by a 2.2 percent estimated MEI for 1996. (The MEI estimate is based on the CBO projection of the GDP deflator of 3.2 percent, adjusted by the historical relationship between the GDP deflator and the MEI.) This results in the final 4.2 percent volume target (1.065 ÷ 1.022 = 1.042).

This principle has guided the Commission for the past three years. For the 1991 performance standard, it recommended a 2.0 percentage point reduction from projected baseline volume growth to move toward this goal. For 1992, it recommended a 2.5 percentage point reduction. For 1993, it recommends an allowance for volume and intensity that is 3.0 percentage points below the Actuary's baseline projection. With current estimates by the Actuary projecting an 8.3 percent growth in volume and intensity, the Commission incorporates a 5.1 percent allowance for volume and intensity into its VPS recommendation ($1.083 \div 1.030 = 1.051$). Combining this 5.1 percent factor with factors for inflation, enrollment, aging, and legislation yields a performance standard of 8.9 percent (see Table 3)[10].

This recommendation is significantly lower than the default value of 11.0 percent. Half of this difference reflects the Commission's decision to recommend a 3 percentage point reduction from the projection of volume and intensity growth, compared to the default performance standard factor of 2 percentage points. The other half reflects the difference between use of a baseline of the historical rate of growth over the period 1988-1992 of 9.2 percent, which is specified for the default, and the Medicare Actuary's baseline projection of 8.3 percent. The Commission has consistently used the Actuary's projection as its starting point.

When the Commission first set its goal, it expected that expenditure growth could be slowed to a sustainable level by 1996. It noted, however, that as new information became available each year, it would have the opportunity to reassess its goal in relation to changes in access, inappropriate utilization, technology, and the ability to identify and reduce services of little or no benefit. This year, the Commission considered two potential issues in this regard before deciding not to modify its 1996 target date.

In its 1992 *Annual Report to Congress*, the Commission observed that while efforts to develop practice guidelines have increased considerably since the passage of OBRA89, the results of many of these efforts are not yet available to most practicing physicians (PPRC 1992a). Nonetheless, there appears to be a significant amount of activity within the medical community beyond development of formal guidelines to provide information or influence medical practice. Given the urgency of the cost problem and the need to continue to stimulate such efforts, the Commission felt that it would be imprudent to extend its goal beyond 1996.

Because of the potential for access barriers if Medicare payments do not keep pace with those of other payers, the Commission also reviewed information on Medicare payment rates in relation to those of private payers (see Appendix B). Comparing allowed charges for Medicare, Blue Shield plans, and a broader sample of private payers that sent data to the MEDSTAT Corporation, it found that in 1989 Medicare paid on average 80 percent of Blue Shield rates and 70 percent of the rates of MEDSTAT private payers. This differential in payment rates reflects in part the sustained effort to restrain price increases in the Medicare program since the mid-1980s, while private payer efforts to control their payment rates were less vigorous. The Commission does not view current payment rates in the private sector as the yardstick for determining appropriate fee levels. Moreover, given that private payers are facing increasing pressures to contain costs, continuation of past trends seems unlikely. For these reasons, the Commission felt that it was premature to alter its 1996 target date.

---

[10] The full calculation of the performance standard is: $1.027 \times 1.014 \times 1.001 \times 1.051 \div 1.007 = 1.088$. When unrounded components are used, the result is 1.089.

Separate Surgical and Nonsurgical Performance Standards

The Commission recommends that the Congress return to a single standard covering all services on both practical and conceptual grounds. The discussion in the previous section illustrates the considerable practical difficulties in setting separate standards. Different baseline rates of increase should be used by category, but the technical ability to differentiate baselines with accuracy does not exist. Advances in medical and surgical diagnosis and therapy continually change the nature of treatment for various conditions. Much of surgery for benign prostatic hypertrophy may be supplanted in the future by new medical therapies. Laparoscopic cholecystectomy will replace medical therapy for some patients with gallstones, just as extracorporeal shock wave lithotripsy has replaced surgery for some with kidney stones.

The separate treatment of surgical and nonsurgical services is at odds with one of the major goals of payment reform: encouraging more effective medical practice. To the extent that setting separate volume performance standards creates a disincentive for physicians to substitute medical services for surgical procedures, the VPS mechanism will work at cross purposes with changes in relative values that encourage such shifts. For example, substitution of primary care for procedures was envisioned as a major goal of payment reform, but making that substitution under the current VPS defaults would lead to decreased payment for primary care. Moreover, as explained above, differential updates could, over time, introduce serious distortions into the resource-based fee schedule.

In the event that the Congress chooses to continue separate standards for surgery and nonsurgery, the Commission attempted to develop advice on a differential in the baseline of volume and intensity for surgical versus nonsurgical services. Nevertheless, it was not able to develop a reliable projection of a differential in baseline volume growth. Two years ago, the Commission felt that an extrapolation of historical trends in volume could serve as a basis for such a projection. But now the most recent historical data come from a period when specialties were making initial efforts to reduce inappropriate care. Thus, it is not possible to separate a slowing in growth of volume due to changes in factors outside of the control of physicians from the results of efforts by the medical profession.

The inability to develop such advice does not imply a conclusion that the baseline should be the same. Rather, it should reinforce the message of the potential inequities and distortion that can result from two volume performance standards.

COMMENTS ON THE SECRETARY'S RECOMMENDATIONS

On May 21, 1992, the Secretary of Health and Human Services submitted recommendations to Congress on the conversion factor update and Volume Performance Standard for 1993. For the update, the Secretary recommended the default values of 2.6 percent for surgical services and 0.3 percent for nonsurgical services (Table 2). As discussed above, the Commission agrees with the amounts (subject to any modification on the basis of its forthcoming analysis of 1991 BMAD data) but recommends that they apply only to 1993 and not enter the base for the conversion factor in later years.

For the Volume Performance Standard, the Secretary recommends an overall standard of 7.3 percent, with a 6.0 percent standard for surgical services and a 7.9 percent standard for nonsurgical services (Table 3). The Commission recommends a higher overall performance standard of 8.9 percent. When the Secretary's recommendation is compared to the Medicare Actuary's baseline of 12.1 percent, the reduction of 4.5 percentage points (1.121 ÷ 1.073 = 1.045) appears to be excessive. The Commission's recommendation of 8.9 percent reflects a 3.0 percentage point reduction and is on a path that will yield performance standards that track with GDP growth by 1996.

The Secretary's differential between the surgical and nonsurgical performance standards reflects the differential impacts of changes in law and regulation but does not attempt to estimate a differential in baseline growth of volume and intensity. The Commission notes the inherent imprecision in defining such differentials. It recommends separate performance standards for surgery and nonsurgery be eliminated. It notes with interest the Secretary's intention to consider such a recommendation for the 1994 performance standard.

MODIFICATIONS OF THE VPS DECISION-MAKING PROCESS

This year the VPS decision-making process was unnecessarily complicated by delays in obtaining necessary information. The Secretary did not submit until May 21 the report to Congress due by April 15. In response to repeated requests, HCFA did make available to the Commission during its meeting on May 7 and 8 some of the information on the defaults. These delays were not isolated instances. Similar, though not as lengthy, delays affected the process in the previous year.

Such delays make it more difficult for the Commission to consider the facts and the views developed by the Secretary. They also make it virtually impossible for the Commission to obtain input from private organizations, such as those representing physicians and Medicare beneficiaries, before reaching its own conclusions.

The Commission believes this process can be facilitated by taking steps to ensure that these delays do not recur in future years. These include a revision of the time schedule and steps to increase the usefulness of data reporting throughout the year.

The Secretary should be required to make two separate reports: one containing the final data, due March 15; the other with recommendations, due April 15. Presumably, the former would be less subject to delay. The Commission would continue to make its own recommendations by May 15 and, if the Secretary's recommendations are delayed substantially, it would comment on the Secretary's report at a later point.

A key component to the success of the VPS process is the availability of timely information on actual outlays and volume increases on both an aggregated and disaggregated (e.g., by type of service) basis. This information could be used by the Congress, physician organizations, and other interested groups to determine on an ongoing basis whether the standards are being met and where the problems are. Presently, these data are not released on a timely basis or in a useful format.

Currently, HCFA is required by OBRA87 to make quarterly reports on expenditures. These reports, compiled by the Bureau of Data Management and Strategy (BDMS), summarize claims data contained in the National Claims History (NCH) System. Currently, these reports contain expenditures for certain service categories by physician specialty. Arraying the data by these categories without disaggregating into components for price and volume limits their usefulness. In addition, the reports are often late.

The Commission recommends that Congress instruct HCFA to redesign the VPS reports and make the NCH data more accessible. If these formats were redesigned to be more "VPS compatible" (e.g., volumes and expenditures by specialty by procedure type) and released in a more timely fashion (e.g., monthly), they could provide the Commission and other interested parties valuable information and permit discussions of VPS decisions to begin long before the Secretary's recommendations are released.

REFINING THE STRUCTURE OF THE VPS

OBRA90 directed the Commission to examine alternative proposals for subnational performance standards. In the past the Commission has considered two alternative approaches: specialty-level and state-level systems (PPRC 1990a).

Based in part on the experience of developing recommendations for surgical and nonsurgical updates and performance standards, the Commission concluded that a specialty-level system would not be feasible. Variations in volume growth rates across specialties are much wider than the difference in rates between surgical and nonsurgical services. Setting differential standards would be that much more important, but the considerable technical difficulties in setting separate surgical and nonsurgical performance standards would apply at the specialty level as well.

The Commission plans to work further on the feasibility of the state-level approach during the coming year. A key factor affecting feasibility is the ability to track and project outlay and volume growth. In the past, the Commission has noted the high degree of variability in annual growth rates that appear to exist at the state level. A significant amount of this variability may be an artifact of the data. Now that the Common Working File (CWF) has been implemented in certain areas for two or three years, the Commission plans to return to the issues of state-level stability by analyzing this file.

APPENDIX A

TRENDS IN EXPENDITURES, PRICES, AND VOLUME

This appendix presents a series of statistical tabulations that illustrate recent trends in outlays, prices, and volume of physicians' services under Medicare. It examines trends for all services included in the Volume Performance Standards (VPS) and then presents data disaggregated by type of service, by physician specialty, and by surgical and nonsurgical category. Since trends for the 1986-1989 period were discussed in last year's report, the tables and discussion highlight changes from 1989 to 1990, the most recent year for which detailed data are available.

The primary data source is the Part B Medicare Annual Data (BMAD) Procedure Files for 1986 through 1990.[1] These files contain detailed data on the frequency and expenditures for all physicians' services incurred during a given calendar year. The procedure file consists of data summarized at the carrier/locality, procedure/modifier, and specialty levels.

TRENDS BY SERVICE

Total outlays increased at a slower rate in 1990 than in the previous period (Table A-1). Both volume and price contributed to this slowing. The slowing of price increases is the result of budget cuts in the Omnibus Budget Reconciliation Act of 1989 (OBRA89). A larger contribution to the slowing of outlays came from a slowing in volume increases, which declined from an annualized rate of 9 percent to 7 percent. Experience with annual fluctuations in previous years suggests that this decline may be either a change in trend or a short-term fluctuation from the historical trend.

Of the major types of services, visits and consultations continue to have the slowest rate of volume growth, at somewhat less than 6 percent in 1990. Within this category, however, eye visits increased by 11 percent while home visits continued their trend of decline.

The most rapidly growing category was "other medical", which increased 18 percent in 1990. Laboratory services and cardiac services had the next highest rates of growth -- in excess of 14 percent per year. In laboratory services, specialized tests have been exhibiting

---

[1] These files are compiled and maintained by the Office of Data Management and Strategy of the Health Care Financing Administration.

Table A-1. Trends in Outlays, Price, and Volume Growth: By Procedure Type, 1986-1990

	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE 1990
PROCEDURE	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
Angioplasty-PTA, PVC	84.20	-0.43	84.99	17.49	-1.10	18.80	0.07
Angioplasty-PTCA	34.86	3.58	30.19	28.56	5.90	21.40	0.63
Echocardiograms	28.07	3.77	23.41	30.04	1.20	28.50	1.38
Electrocardiograms	11.35	4.59	6.46	3.18	-3.30	6.70	2.83
Medical, Cardiovascular	20.75	4.15	15.93	14.16	5.90	7.80	0.10
Medical, Cardiac Cath	26.29	4.82	20.48	17.29	2.80	14.10	1.87
Medical, Other Cardiovasc	14.72	5.11	9.15	14.17	3.60	10.20	0.99
Subtotal-Cardiac Services	**19.92**	**4.30**	**15.02**	**14.93**	**0.68**	**14.01**	**7.86**
Consultations	11.02	3.81	6.95	4.85	3.10	1.70	3.51
Visits, Emergency	22.00	6.20	14.88	17.29	8.00	8.60	1.58
Visits, Eye	22.02	3.72	17.64	15.23	3.90	10.90	1.72
Visits, Home	1.47	5.10	-3.45	-1.33	3.10	-4.30	0.14
Visits, Hospital	6.63	3.90	2.63	5.99	3.30	2.60	9.81
Visits, Nursing/Rest Home	8.91	4.20	4.52	13.65	3.60	9.70	1.05
Visits, Office	11.76	5.18	6.26	13.20	5.30	7.50	13.07
Visits, Preventive	-11.49	1.90	-13.14	27.41	2.50	24.30	0.00
Subtotal-Visits/Consultation	**10.74**	**4.52**	**5.94**	**10.23**	**4.41**	**5.55**	**30.87**
Endoscopy, (not TURP, Colon, Upper GI)	12.37	3.52	8.55	13.04	3.80	8.90	1.38
Endoscopy, Colon/Anus	16.20	3.12	12.68	4.76	-4.50	9.70	1.88
Endoscopy, Upper GI	16.07	2.17	13.61	12.21	2.10	9.90	1.32
Subtotal-Endoscopy	**15.01**	**2.97**	**11.71**	**9.41**	**-0.09**	**9.52**	**4.58**
Imaging, Ultrasound Not Cardiac	10.84	-3.50	14.86	15.10	-4.40	20.40	1.16
Radiology, CAT Scans	11.42	-1.57	13.20	3.14	-7.00	10.90	1.88
Radiology, MRI	61.47	-6.13	72.01	33.39	-5.60	41.30	0.76
Radiology, Other Diagnostic	9.22	2.88	6.16	3.76	-2.30	6.20	6.29
Subtotal-Diagnostic	**12.54**	**0.84**	**11.92**	**7.18**	**-3.66**	**11.35**	**10.09**
Surgery, Arthroscopy	25.72	2.45	22.72	13.95	-6.90	22.40	0.26
Surgery, CABG	11.39	1.46	9.79	3.56	-5.60	9.70	1.73
Surgery, Cataract Other	-27.30	-1.56	-26.14	1.10	0.40	0.70	0.05
Surgery, Cataract Lens Replacement	4.99	-2.08	7.21	2.65	-5.30	8.40	5.85
Surgery, Joint Prosthesis	9.41	1.35	7.96	9.97	2.30	7.50	1.63
Surgery, Other	10.03	2.66	7.18	7.97	1.00	6.90	17.19
Surgery, Prostate (Not TURP)	20.47	3.06	16.90	33.16	4.60	27.30	0.17
Surgery, Prostate (TURP)	0.56	1.54	-0.97	-5.53	-3.80	-1.80	0.81
Surgery, Secondary Cataract-Laser	63.94	8.64	50.90	15.37	3.10	11.90	1.02
Surgery, Secondary Cataract	-36.91	0.02	-36.92	-42.59	0.90	-43.10	0.02
Subtotal-Surgery	**10.06**	**1.58**	**8.26**	**6.83**	**-0.73**	**7.62**	**28.73**
Lab Auto Multichannel Test	6.06	-5.40	12.12	7.47	-0.40	7.90	0.82
Lab, Other Tests	21.10	0.56	20.43	17.00	0.60	16.30	5.57
Lab, Surg/Anat Pathology	15.50	6.61	8.34	15.80	4.70	10.60	1.44
Subtotal-Lab Services	**18.19**	**0.97**	**17.11**	**15.78**	**1.25**	**14.37**	**7.82**

Table A-1 continued

PROCEDURE	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE 1990
	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
Medical, Allergy	20.64	1.88	18.41	22.77	4.40	17.60	0.13
Medical, Chemotherapy	20.49	5.95	13.72	51.24	1.30	49.30	0.28
Medical, Critical Care	18.30	6.69	10.88	8.89	4.40	4.30	1.53
Medical, Eye	22.30	3.69	17.95	13.09	3.00	9.80	0.79
Medical, Gastrointestinal	14.34	5.80	8.07	21.95	6.60	14.40	0.01
Medical, Immunization	17.91	-3.59	22.31	132.97	4.80	122.30	0.07
Medical, Neurology	17.40	4.62	12.21	16.56	3.70	12.40	0.43
Medical, Otolaryngology	13.68	2.99	10.38	15.76	6.40	8.80	0.16
Medical, Pulmonary	23.69	5.44	17.31	22.99	3.70	18.60	0.41
Medical Services, Other	18.19	4.79	12.80	33.75	3.60	29.10	1.61
Subtotal-Other Medical	**19.19**	**5.10**	**13.43**	**22.84**	**3.76**	**18.44**	**5.42**
All Other Codes	**14.12**	**1.62**	**13.33**	**1.03**	**30.50**	**-11.98**	**3.67**
TOTALS	**11.90**	**2.64**	**9.01**	**9.04**	**2.10**	**6.80**	**100.00**

Source: PPRC analysis of BMAD-I data for 1986 through 1990.

Notes: Data are for Part B carriers judged to have reported data consistently over this time period. These carriers accounted for 55.4 percent of all expenditures over this time period.

Anesthesiology and assistants-at-surgery are excluded from the analysis. In addition, psychiatric and dialysis services are not reported separately due to unreliable price data.

the most rapid growth. In cardiac services, angioplasties slowed their extraordinary rates of growth, but growth in echocardiography accelerated.

Considerable attention has been paid to growth in magnetic resonance imagings (MRIs) (Hamilton et al. 1989). Between 1986 and 1989 the volume of MRIs grew on average at 72 percent. Between 1989 and 1990, the rate of growth slowed by almost half to 41 percent, which still, however, represents very rapid growth.

PHYSICIAN SPECIALTY

Growth in outlays and volume of services vary widely by physician specialty (Table A-2). Outlays for gastroenterology increased the fastest, with an average growth rate of 23 percent between 1986 and 1989. This was in large part due to volume increases, which accounted for 19 of the 23 percentage points. Growth slowed significantly in 1990, however, to 13 percent for both outlays and volume. Independent laboratories experienced the highest volume increases, both on average between 1986 and 1989 with a 21 percent rate of growth, and more recently between 1989 and 1990, with a 19 percent growth rate. The slowest growing specialty category was general surgery, with a five-year average growth in outlays of slightly less than 5 percent.[2]

Table A-2. Trends in Outlays, Price, and Volume Growth: By Physician Specialty, 1986-1990

PHYSICIAN SPECIALTY	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE 1990
	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
Gastroenterology	23.01	3.10	19.32	12.95	-0.40	13.40	2.56
Independent Labs	20.70	-0.21	20.95	19.21	0.60	18.50	4.21
Cardiovascular Disease	20.62	4.08	15.89	15.93	1.60	14.10	7.63
Pulmonary Disease	18.34	3.57	14.27	13.89	2.60	11.00	1.56
Pathology	16.30	6.40	9.30	13.08	4.20	8.00	1.33
Podiatry-Surgical	15.99	3.42	12.15	15.74	2.70	12.70	1.46
Dermatology	14.13	4.09	9.65	16.56	5.20	10.80	1.90
Neurology	13.61	3.94	9.31	9.89	2.80	6.90	1.33
Radiology	13.12	2.12	10.77	7.70	-4.10	12.30	9.16
Thoracic Surgery	12.30	2.49	9.57	1.61	-3.60	5.40	3.12
Ophthalmology	11.99	1.11	10.76	6.84	-1.80	8.80	12.06
Otolaryngology, Laryngology Rhinology	11.79	3.55	7.96	14.19	3.90	9.90	1.13
Orthopedic Surgery	10.25	2.35	7.72	10.73	1.40	9.20	5.13
Urology	10.21	3.55	6.43	14.03	1.90	11.90	3.68
Internal Medicine	9.96	3.76	5.97	8.57	4.60	3.80	16.12
Family Practice/GP	9.55	4.41	4.92	9.39	3.30	5.90	8.95
General Surgery	7.37	3.06	4.18	4.22	0.50	3.70	6.21
Clinic or Group Practice	5.73	2.37	3.28	-1.57	5.50	-6.70	4.65
All Other	16.96	1.54	15.16	16.97	3.00	14.28	7.04
TOTAL	**11.90**	**2.65**	**9.01**	**9.04**	**2.10**	**6.80**	**100.00**

Source: PPRC analysis of BMAD-I data for 1986 through 1990.

Notes: Data are for Part B carriers judged to have reported data consistently over this time period. These carriers account for 55.4 percent of all expenditures over this time period.

Anesthesiology, assistant-at-surgery, nephrology, and psychiatry were excluded from this analysis.

Outlays and volume for the primary care specialties relevant to the Medicare population (internal medicine and family practice/general practice) had historical growth rates that were slightly lower than the overall average. These specialties also had lower-than-average growth in volume between 1989 and 1990.

---

[2] Clinics and group practices actually experienced the lowest volume growth rates. This is more a reflection of changes in coding practices by carriers than an actual trend in service volume.

SURGICAL AND NONSURGICAL SERVICES

OBRA89 requires the setting of separate performance standards for surgical and nonsurgical services. In 1990, the Secretary defined surgical services to include only those services that had a "type of service" classification of surgery[3] and were performed by surgeons.[4] Within these VPS-designated categories, outlays for surgical services had an average historical growth rate of 10 percent, which was 2 percentage points lower than the 12 percent growth for nonsurgical services (Table A-3). Between 1989 and 1990, this gap increased to almost 4 percentage points. As reported in the Commission's 1990 VPS report (PPRC 1990b), this gap in growth rates is due in large part to lower increases in fees for surgical services relative to nonsurgical services. Different growth in fees reflected Medicare policies such as higher updates for primary care and reductions in payment rates for overvalued procedures. Most services designated for such reductions were surgical services.

At the procedure level, the sources for this trend are reductions in outlay growth for cataract lens replacements, and, to a lesser extent, for other surgical services. For these procedure groups, fee reductions constitute the primary cause of the slowing in the growth of outlays. This is particularly the situation for cataract surgery, which experienced average annualized fee reductions of almost 2 percent between 1986 and 1990. More significantly, between 1989 and 1990, average cataract prices decreased more than 5 percent.

Focusing on rates of growth in volume, the comparison between surgical services and nonsurgical services is different. Over the 1986-1989 period, nonsurgical services grew more rapidly, by somewhat more than 1 percentage point per year. But in 1990, surgery grew slightly faster than nonsurgery. Again, it is difficult to generalize much from the experience of a single year.

---

[3] Type of service is one of the data elements reported on Part B claims.

[4] VPS-defined surgeons include general surgeons, neurosurgeons, obstetricians, gynecologists, ophthalmologists, oral surgeons, orthopedic surgeons, otorhinolaryngologists, plastic surgeons, proctologists, thoracic surgeons, urologists, podiatrists, dermatologists, hand surgeons, and multispecialty clinics (HHS 1990).

Table A-3. Trends in Outlays, Price, and Volume Growth: Surgical and Nonsurgical Services, 1986-1990

	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE OF 1990
PROCEDURE	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
All Services	11.90	2.65	9.01	9.04	2.10	6.80	100.00
All Surgical Services	10.23	1.89	8.19	6.44	-0.80	7.30	28.42
All Nonsurgical Services	12.67	3.01	9.39	10.22	3.30	6.70	71.58
Surgical Services							
Surgery, Other	10.00	2.70	7.11	7.66	0.90	6.70	54.15
Surgery, Cataract Lens Replacement	9.33	-0.48	9.86	2.83	-5.40	8.70	20.49
Surgery, Joint Prosthesis	9.45	1.35	7.99	9.97	2.20	7.60	5.69
Surgery, CABG	12.03	1.43	10.46	1.08	-5.80	7.30	5.42
Endoscopy, (not TURP, colon)	11.96	3.56	8.11	13.27	4.40	8.50	3.60
Surgery, Secondary Cataract-Laser	63.70	8.71	50.59	15.67	3.00	12.30	3.56
Surgery, Prostate (TURP)	0.65	1.57	-0.91	-5.63	-3.90	-1.80	2.84
All Other Surgical Services	11.36	2.33	8.70	8.99	-2.58	11.84	4.26
Nonsurgical Services							
Visits, Office	11.76	5.18	6.26	13.20	5.30	7.50	18.26
Visits, Hospital	6.63	3.90	2.63	5.99	3.30	2.60	13.70
Radiology, Other Diagnostic	9.22	2.88	6.16	3.76	-2.30	6.20	8.79
Lab, Other Tests	21.10	0.56	20.43	17.00	0.60	16.30	7.78
Consultations	11.02	3.81	6.95	4.85	3.10	1.70	4.90
Electrocardiograms	11.35	4.59	6.46	3.18	-3.30	6.70	3.95
Radiology, CAT Scans	11.42	-1.57	13.20	3.14	-7.00	10.90	2.62
Medical, Cardiac Cath	20.78	4.15	15.96	17.29	2.80	14.10	2.59
Surgery, Other	10.11	2.40	7.53	10.61	1.20	9.30	2.52
Visits, Eye	22.02	3.72	17.64	15.23	3.90	10.90	2.40
Radiology, Therapeutic	16.51	7.53	8.35	8.90	-11.10	22.50	2.35
Medical Services, Other	18.19	4.79	12.80	33.75	3.60	29.10	2.25
Visits, Emergency	22.00	6.20	14.88	17.29	8.00	8.60	2.20
Medical, Critical Care	18.30	6.69	10.88	8.89	4.40	4.30	2.13
Lab, Sur/Anat Pathology	15.50	6.61	8.34	15.80	4.70	10.60	2.01
All Other Nonsurgical Services	16.74	1.30	15.20	15.32	0.53	14.81	18.12

Source: PPRC analysis of BMAD-I data for 1986 through 1990.

Notes: Data are for Part B carriers judged to have reported data consistently over this time period. These carriers accounted for 55.4 percent of all expenditures over this time period.

Anesthesiology and assistants-at-surgery are excluded from the analysis. In addition, psychiatric and dialysis services are not reported separately due to unreliable price data.

APPENDIX B

APPROPRIATENESS AND ACCESS

The Volume Performance Standard (VPS) policy reflects congressional concerns about both access to and quality of care. Evidence of inappropriate services and barriers to access were included as two of the factors specified by the Omnibus Budget Reconciliation Act of 1989 (OBRA89) to be considered in formulating recommendations on the conversion factor update and performance standards. This appendix contains a summary of the available evidence on inappropriate care and barriers to access.

The available evidence on inappropriate care was reviewed in the Commission's 1990 VPS report (PPRC 1990b). This review found evidence of substantial amounts of inappropriate care, but considerably lower levels of payment denial. Since then, little new evidence on inappropriate care has emerged. Several studies are currently underway, however, that may provide useful information. The results from these studies will be analyzed as they become available. The evidence that has emerged is not of sufficient scope to infer the incidence rate of inappropriate services or whether it has changed. The Commission, therefore, has not been able to incorporate into its recommendations any adjustments due to changes in inappropriate care.

Evidence on barriers to access and the issues related to measuring them are covered in detail in the Commission's report on monitoring access (PPRC 1992b). The access report focuses on establishing baseline patterns of utilization. This step is necessary to analyze any changes that have occurred since the physician payment reforms were put into place.

Differences in relative payment rates among payers may affect access to care. Therefore, data on payment rates from the Blue Cross and Blue Shield Association and a broader sample of other private payers were compared to Medicare data to assess the potential impact of the Medicare Fee Schedule on beneficiary access. These analyses indicate that in 1989 Medicare paid on average about 80 percent of Blue Shield Plans and about 70 percent of what private payers paid for physician services. Preliminary projections indicate that, assuming Medicare, Blue Shield, and other private payer payment rates keep pace with the rate of inflation, by the time the Medicare Fee Schedule is fully implemented in 1996, these gaps would widen, with Medicare paying 72 percent of Blue Shield rates and 64 percent of private payer rates. If these projections are realized, barriers to access may develop.

INAPPROPRIATE SERVICES

Inappropriate care has been defined in various ways to indicate that services should not or need not be given. The most commonly used definition uses a benefit-risk assessment to determine whether the service is likely to produce a net medical benefit to the patient (Brook et al. 1989).

Some might define inappropriateness in terms of benefit-cost analysis, which considers all of the medical and financial costs associated with the service. This approach, however, is more controversial because it is difficult to measure benefits and costs on the same scale and because value judgments must often be used to determine whether a given benefit is worth its cost.

A number of approaches have evolved to measure the incidence of inappropriate care. One approach entails reviewing medical records to determine if the services received by a patient were appropriate, given the existing condition(s). Criteria for deeming a service inappropriate are developed by consensus of a panel of experts (Park et al. 1986). An alternative approach uses larger epidemiologic databases to develop an estimate of expected procedure utilization and then compares this to actual utilization patterns.

Evidence of Inappropriate Care

In the Commission's 1990 VPS report (PPRC 1990b), the available evidence on appropriateness was presented. The studies reviewed in that report indicated that a significant percentage of care was inappropriate. Estimates for individual procedures ranged from 13 percent to 32 percent. By contrast, an analysis of peer review organization (PRO) and carrier denial rates found that only about 2 percent of hospital admissions were denied by the PROs as inappropriate or medically unnecessary.

Since the time of the 1990 report, little additional evidence on inappropriate care has emerged. One exception, however, is a computerized review system developed by a privately owned utilization review firm (Dubois 1991). This firm uses an expert consensus process similar to that described above to determine inappropriate indications for procedures. Ratings are applied prospectively to proposed procedures. After physician review, 10 to 15 percent of procedures were not authorized because they were considered unnecessary.

Adequacy of the Available Information to Monitor Inappropriate Services

Two types of information are required to properly monitor changes in the incidence of inappropriate services: baseline estimates of inappropriate utilization before 1990 (prior to the first VPS), and evidence of inappropriate services after 1990.

The available information is not sufficient to monitor changes in levels of inappropriate care. This is due to a combination of factors. Existing studies covered only a small number of services in a limited number of geographic settings. This narrow scope makes it difficult to generalize the findings. In addition, these studies were conducted prior to the first VPS in 1990, limiting the ability to measure changes in inappropriate care since then.

Ongoing Work

Commission staff have identified ongoing work that may provide new information on the incidence of inappropriate care. As noted above, there is very little data on post-1990 inappropriate utilization. Even though some of this work is not specific to Medicare, it may provide useful information.

The AMCC/RAND/AMA Clinical Appropriateness Initiative. In March 1990, the Academic Medical Center Consortium (AMCC), the RAND Corporation, and the American Medical Association (AMA) began a three-year joint project to analyze four surgical procedures: abdominal aortic aneurysm resection, coronary artery bypass graft (CABG), cataract extraction, and carotid endarterectomy. The methodological approach consists of four phases:

- Criteria Development. Appropriateness criteria are developed based on a literature review and two rounds of physician panel ratings.
- Appropriateness Measurement. One hundred medical case records at each of twelve institutions are reviewed to obtain estimates of the incidence of inappropriate care and also to assess and modify the classification criteria.
- Interventions. A series of interventions will be performed for some of the cases deemed inappropriate. The results of these interventions will then be tracked to monitor their effectiveness.
- Performance Measurement. Based on revised criteria, up to 100 additional records per institution will be analyzed to measure the effectiveness of interventions in altering the amount of inappropriate care.

Results from the first round of record analysis are scheduled to be published in September 1992. These data may be useful in expanding the number of procedures and settings for purposes of obtaining baseline estimates of inappropriate care. If these data cover more recently provided services, they may be useful for monitoring changes in the incidence of inappropriate care. The second round data should be available in December 1993. These data may be of similar use as the first round data.

Patient Outcome Research Teams (PORTs). The Agency for Health Care Policy and Research (AHCPR) is funding more than 35 studies of the effectiveness of treatment for a variety of conditions (PPRC 1992a). AHCPR's 12 PORTs are large multi-year projects that utilize multiple sources of data, including data from community practice, to document and analyze variations in practice and patient outcomes. If these projects are successful, practice guidelines can be developed to define when treatment is appropriate.

Agency for Health Care Policy and Research Sponsored Practice Guidelines. AHCPR is also sponsoring the development of practice guidelines based upon existing knowledge of effectiveness. To date, AHCPR has released three guidelines on the management of acute pain, urinary incontinance, and pressure ulcers. Thirteen other guidelines are scheduled to be completed by the end of 1993 (PPRC 1992a).

Valid practice guidelines, combined with profiling of physician practice patterns, can be used to screen for high rates of inappropriate treatment. Rates of service use, such as diagnostic tests or procedures, that are associated with appropriate care can be determined when guidelines are followed in community practice. These rates can then be compared to those for similar populations of patients. If the utilization rates for the patient populations in question substantially exceed the rates that would be expected with appropriate care, the excess may be due to inappropriate care.

Because the quality and availability of practice guidelines and relevant data from community practice are not now ideal, at present such discrepancies in utilization rates should be investigated further to ensure that there is no other reason for the disparities. It may be several years until effectiveness research, practice guidelines, and profiling develop sufficiently to permit this technique of detecting inappropriate care to be used widely. The Commission, however, hopes that, once these tools do come into wider use, the ability to ascertain the amount of inappropriate care will greatly increase.

ACCESS

As stated in its 1992 *Annual Report to Congress*, the Commission intends to play an active role in monitoring changes in access to health services (PPRC 1992a). Maintaining an acceptable level of access to care is important to the success of physician payment reform. The Commission's report on monitoring access contains a detailed discussion of the Commission's work to date and future plans for monitoring access (PPRC 1992b).

Summary of the Commission's Report on Access

OBRA89 requires the Secretary to report to Congress annually on changes in access to, utilization of, and appropriateness of Medicare physicians' services. OBRA89 also requires the Commission to review and comment upon the annual report from the Secretary due on April 15. The Commission's activities and findings are discussed in the Commission's 1992 report on monitoring access (PPRC 1992b).

In brief, the focus of this report is on establishing baseline patterns of utilization and testing the stability and validity of different measures of access. This is a necessary step for analyzing any changes that have occurred since the reforms were put into place.

Based on an analysis of data for 1986 through 1990, three significant findings are contained in this report. First, black beneficiaries, beneficiaries in urban high-poverty areas, and beneficiaries in urban Health Professional Shortage Areas received fewer health care services and had poorer health care outcomes than other beneficiaries. Second, beneficiaries in rural areas and in areas that will receive sharp fee increases under the Medicare Fee Schedule received fewer services, but did not appear to have worse outcomes as captured by mortality rates and hospitalizations that are unusually costly or lengthy. Third, beneficiaries in areas that are due to receive large fee decreases under the fee schedule had significantly higher service use than the average beneficiary.

Payment Rates in Medicare as Compared with Private Insurance

A factor that could affect Medicare access is how Medicare payment rates compare with those of private payers. For the past three years the Blue Cross and Blue Shield Association has provided the Commission with data comparing Blue Shield and Medicare payment and utilization rates.[1] Data for 25 Blue Shield plans were used for a series of comparisons for each year during the 1988-1990 period. This year, the Commission also purchased claims data for 1989 collected by the MEDSTAT Corporation. The MEDSTAT data consist of approximately 12 million records from over 100 private payers. These payers comprise a mix of Blue Shield plans, self-insured firms, and commercial insurance plans.

These claims data from private payers reflect a broad sample of experience in paying physicians. They include not only data from traditional reasonable charge payment methods, but also data on payments for services provided under contracts with limited networks of providers, such as preferred provider organizations.[2] Nevertheless, comparisons with Medicare are subject to imprecisions. For example, these files might not be representative of the proportion of services governed by negotiated contracts.

---

[1] The Commission would like to thank Richard Maturi and Robert Lapp of the Blue Cross and Blue Shield Association for providing these data.

[2] It should be noted that the comparisons are for 98 services that have the highest proportions of Medicare charges. In developing the comparisons, the services are weighted by proportion of Medicare charges. While this is the appropriate weighting for analyzing how Medicare payment rates compare to those of private payers, the comparisons could be different if private-payer service weights were used.

Differences in payment policies, such as definitions of global surgical procedures, may also affect the comparisons.

In 1989, Medicare payment rates were 79 percent of those in Blue Shield. Blue Shield plans generally pay at lower rates than commercial insurers. The MEDSTAT file, which includes both types and self-administered plans as well, shows that Medicare pays 70 percent of rates paid by private insurers (Table B-1).

Table B-1. **Allowed Charges for Physicians' Services: Ratio of Medicare to Blue Shield Plans, 1988-1990**

	1988	1989	1990	PERCENT CHANGE 1988-1990
All Services (98 codes)	0.78	0.79	0.77	-2.9
Visits and Consultations (28 codes)	0.75	0.75	0.74	-1.3
Overvalued Procedures (28 codes)	0.85	0.82	0.78	-8.4
Surgical Procedures (20 codes)	0.81	0.82	0.80	-0.9
Medical Procedures (5 codes)	0.80	0.82	0.79	-0.5
All Other Services (17 codes)	0.78	0.79	0.75	-4.7

Source: PPRC analysis of data provided by the Blue Cross and Blue Shield Association.

Notes: Due to differences between Blue Shield and Medicare claims data these statistics should be interpreted with caution.

Radiology, pathology, and anesthesia services are omitted.

Overvalued procedures are not included in other categories of services.

The difference between Medicare and private rates has been increasing. Between 1988 and 1990, the overall ratio of Medicare allowed charges relative to Blue Shield charges declined by 2.9 percent (Table B-1).[3] The overvalued procedures experienced the largest decline with a reduction of 8.4 percent over this period. These findings are consistent with those reported in last year's VPS report (PPRC 1991b). These declines in the ratio likely reflect the effects of Medicare fee constraints.

---

[3] It should be noted that these statistics are not directly comparable to those reported in last year's report (PPRC 1991b) due to differences in the Blue Shield plans and the procedures contained in the analysis.

Steeper fee cuts took effect after 1990. These include reductions of 5 to 7 percent for radiology, anesthesia, pathology, and other surgical and technical services that took effect in 1991. The overvalued procedures were cut in 1991 by the same amount as in 1990. Under the first year of the Medicare Fee Schedule in 1992, the baseline adjustment reduced the average fee by about 3 percent. By 1996, the baseline adjustment will total 6.5 percent. Taken together these fees cuts are larger than those during the 1988-1990 period. Therefore, the difference between Medicare and private payer rates may widen further. Taking into account the net effect of these cuts and the assumption that private payer payment rates will keep pace with inflation, the ratio of Medicare to Blue Shield is projected to decline to 72 percent and the ratio of Medicare to the MEDSTAT payers to 64 percent (Table B-2).

Table B-2. Allowed Charges for Physicians' Services: Ratio of Medicare to Blue Shield Plans and Private Insurers, Selected Years

	RATIO OF MEDICARE TO BLUE SHIELD PLAN			RATIO OF MEDICARE TO PRIVATE INSURERS		
	1989	1991[a]	1996[a]	1989	1991[a]	1996[a]
All Services (84 codes)	0.79	0.75	0.72	0.70	0.67	0.64
Visits and Consultations (28 codes)	0.75	0.82	1.02	0.65	0.70	0.87
Overvalued Procedures (28 codes)	0.82	0.69	0.54	0.78	0.66	0.51
Surgical Procedures (13 codes)	0.82	0.67	0.55	0.73	0.63	0.51
Medical Procedures (5 codes)	0.82	0.75	0.46	0.65	0.68	0.42
All Other Services (10 codes)	0.79	0.75	0.58	0.69	0.67	0.53

Source: PPRC analysis of data provided by the Blue Cross and Blue Shield Association, the BMAD-I, and the MEDSTAT database.

Notes: Due to differences between Blue Shield and Medicare claims data, these statistics should be interpreted with caution.

Radiology, pathology, and anesthesia services are omitted.

Overvalued procedures are not included in other categories of services.

[a] Projected.

This growing difference between Medicare and private insurers does not necessarily mean that Medicare rates are too low. At least part could be a reflection that private payers' rates are too high. Indeed, additional efforts by private payers to control their payment rates could lead to the difference between Medicare and private payers growing more slowly than projected or actually being reduced.

The Blue Shield data provided an opportunity to compare rates of growth of service volume between Medicare and Blue Shield (Table B-3). Blue Shield plans experienced a more rapid rate of increase in volume of services per enrollee during the 1988-1990 period (9.2 percent per year versus 6.4 percent). This result is in sharp contrast to calculations for 1984-88 by HHS that suggested that Medicare volume has been increasing more rapidly than for the population as a whole (Sullivan 1990). It may illustrate the pitfalls of estimating volume by deflating national health expenditure data by the physician fee component of the Consumer Price Index.[4]

Table B-3. Physicians' Services: Medicare and Blue Shield Plan Volume Per Enrollee, 1988-1990

	NUMBER OF SERVICES PER ENROLLEE Average Annual Percentage Change		
	1988-1989	1989-1990	1988-1990
All Services (95 codes)			
Blue Shield	9.2	9.2	9.2
Medicare	5.6	7.1	6.4
Visits and Consultations (28 codes)			
Blue Shield	12.3	5.7	9.0
Medicare	5.0	5.4	5.2
Overvalued Procedures (27 codes)			
Blue Shield	-4.1	12.8	4.0
Medicare	1.7	7.7	4.7
Surgical Procedures (20 codes)			
Blue Shield	9.3	14.0	11.6
Medicare	7.3	8.3	7.8
Medical Procedures (5 codes)			
Blue Shield	10.3	15.3	12.8
Medicare	11.3	9.3	10.3
All Other Services (15 codes)			
Blue Shield	13.9	16.1	15.0
Medicare	10.8	10.4	10.6

Source: PPRC analysis of data provided by the Blue Cross and Blue Shield Association.

Notes: Due to differences between Blue Shield and Medicare claims data these statistics should be interpreted with caution.

Radiology, pathology, and anesthesia services are omitted.

Overvalued procedures are not included in other categories of services.

---

[4] Increases in the CPI may overstate increases in payment rates by not adequately reflecting the increasing prevalence of discounts.

APPENDIX C

TECHNOLOGICAL CHANGE

The impact of new and diffusing technologies on expenditure growth is another factor specified by Omnibus Budget Reconciliation Act of 1989 (OBRA89) to be considered in formulating the Volume Performance Standard (VPS) recommendations. This requirement expresses the Congress' concern that a significant share of the growth in the volume and intensity of services may be due to the impact of technological change.

Technological change has always been an integral part of medicine. In the 1930s and 1940s technological innovations took the form of new drugs to control infectious diseases (Thomas 1977). These innovations were truly cost-saving as the treatment costs of infectious diseases were reduced or completely eliminated. Since then, however, changes in technology have increasingly taken the form of complex and costly equipment and procedures that may or may not be cost-saving. New and diffusing technologies are now commonly identified as major factors in the rapid growth of health care costs (Hamilton et al. 1989).

This appendix contains the Commission's analysis of the effects of new and diffusing technologies on volume growth. Estimating the effects of technological change is a complex task. Conceptual and measurement difficulties introduce an unknown amount of imprecision into the process. Estimates of the share of cost increases attributed to new technologies have varied considerably -- ranging from 12 percent (Lee 1991) to over 50 percent (OTA 1984). This variation results from the difficulties in identifying and measuring new technologies, accounting for their impacts on existing procedures, as well as other differences in methodological approaches.

The Commission's analysis for this year was restricted to accounting for only the direct effects on volume growth of a group of services identified by medical and surgical specialty societies as new technologies. The results indicate that, based on this group of services, about 14 percent of the average growth in volume between 1986 and 1990 can be attributed to new and diffusing technologies. This estimate is similar to estimates reported in the 1990 and 1991 VPS reports.

IDENTIFICATION AND MEASUREMENT OF TECHNOLOGICAL CHANGE

Estimating the effects of technological change on medical care costs is a complex undertaking. The characteristics of new technologies, the factors that affect their use, and the ways they are integrated into medical practice make it difficult to estimate their impact on expenditures from year to year. This section presents a discussion of some of the issues related to identifying and measuring the effects of technological change.

Product versus Process

Technological changes can be characterized along at least three dimensions: impacts on cost, impacts on quality of care, and the form by which they are manifested (Garrison and Brown 1991). Technologies can be either cost increasing, decreasing, or neutral. At the same time they can either enhance, have no effect on, or reduce the quality of care. They can take the form of new medical procedures or equipment (i.e., a new product) or appear via changes in the way existing procedures are performed or the way medical practice is organized (i.e., a change in process).

It is less difficult to identify and measure new product technologies than change-in-process technologies. New product technologies will typically have a newly designated Current Procedural Terminology (CPT) code in recognition that they are fundamentally different from other procedures. Examples of these technologies include magnetic resonance imaging (MRI), endoscopies, and ultrasonic diagnostic procedures.

The very nature of change-in-process technologies makes them difficult to identify and measure. For example, physicians could adopt more efficient methods of scheduling and providing evaluation and management services. These changes would not necessarily be reflected via new CPT codes. Nor necessarily would changes in surgical procedures that do not include the use of a new medical device.

Complementary versus Substitute Procedures

In theory, technologies are adopted only if they provide new capabilities or improve on existing capabilities. Technologies in the latter group should substitute for some existing procedure. Therefore, an analysis of the costs of technological change should account for reductions in these substitute procedures.

In practice, though, substitution effects are difficult to measure. For example, a new technology may improve upon aspects of more than one existing technology. Therefore, this new technology may only substitute for a subset of the capabilities of any one of the existing technologies, not the entire technology. In addition, the full capabilities and uses of a new technology are sometimes ascertained only when the technology starts to diffuse (Greer 1988). Therefore, the identification of substitute technologies can only be done well into the diffusion process. In instances where identification of substitutes appears certain, analysis has found some counterintuitive relationships. For example, a recent study of established technologies and relatively newer substitute ones found that both technologies continued to experience growth. This was largely due to patients receiving both technologies (Boutwell and Mitchell 1991).[1]

Incentives that Increase the Use of New Technologies

The characteristics of some new technologies may increase the demand for their use. There are three sources for these effects. First, many new technologies are less invasive, thus posing lower risk to patients (Smith 1992). These types of innovations increase the number of eligible patients who previously would have been considered to be at too high risk to undergo the procedure.

Second, patients often want newer technology-based procedures. Patients are becoming increasingly aware of high-profile advances in medical technology. In situations where older technology-based procedures may be adequate, patients may nonetheless demand new, more expensive tests and treatments.

Third, as technologies diffuse and mature, additional applications are often found. Technologies often diffuse faster than professional agreement on their capabilities and applications. A technology that was designed as a diagnostic test for one specific illness, for example, may be adopted to test for illnesses for which it was not originally indicated and its efficacy has not been assessed.

In addition, new technologies may have indirect effects on the demand for existing technologies and procedures. Again, consider a new diagnostic test. Due to its expanded capability over existing tests, it may detect the presence of additional unrelated illnesses that would not previously have been detected. The treatment of these illnesses may, in turn, necessitate the provision of additional services.

Alternative Methodological Approaches

Most studies of the effects of technological change on costs have used one of four general approaches (Altman and Wallack 1979). These approaches are:

- Excess Inflation Approach. Increases in input costs for medical care in excess of an average rate of inflation are interpreted as reflecting the impacts of technological change. These cost impacts are attributed to the increasing sophistication of newer technologies and increases in service intensity per illness.

---

[1] Similar findings have been reported by Eisenberg et al. (1989).

- Residual Approach. Expenditures over time are analyzed in terms of a set of explanatory factors. The portion of expenditures that cannot be explained by these factors is attributed to technological change.

- Specific Technology Approach. This approach consists of identifying new technologies and measuring their impacts on total costs.

- Specific Illness Approach. Detailed data on the types and costs of procedures used to treat a number of specific illnesses are analyzed over time. Changes in the mix of procedures are interpreted as reflecting the effects of technological change.[2]

The excess inflation approach is of limited usefulness because it attributes all changes in cost to only two factors: inflation and technology. The other three approaches are better able to attribute changes in cost to changes in technology but they too are limited in their ability to provide reliable estimates. Each has its individual strengths and weaknesses. The residual approach is better able to yield generalizable estimates of technology impacts. But it too attributes all changes in cost not otherwise identified as due to technology. This would tend to inflate the estimated effects of technology because all other factors not explicitly identified as non-technology-based would be counted as technology-based.

The specific technology and specific illness approaches are better able to attribute changes in costs directly to changes in technology. The weakness of the specific illness approach is that it is difficult to generalize these results to all conditions. The weakness of the specific technology approach is that it may not account for all of the indirect effects of technological change, resulting in potential underestimation of the total effects.

This discussion indicates that, given the limitations of these approaches, the true impact of technological change cannot at present be precisely estimated. Nonetheless, comparison of the results of these different estimation approaches can give a sense of the range of technological impacts. For example, estimates from the specific technology approach could represent the lower bound and those derived from the residual approach could reflect the upper bound.

ESTIMATED IMPACTS OF NEW AND DIFFUSING TECHNOLOGIES

The Commission has taken a first step in the past two years to try to understand and measure the impact of technological change on volume growth. Using a "specific technology" approach, it has developed estimates of the effects of a set of technologies identified as new or emerging by specialty societies. As the discussion in the prior section indicates, the Commission recognizes the limitation of this approach in potentially understating the impacts of technological change on volume growth. It does, however, provide the opportunity to identify and track specific technologies over time.

---

[2] An example of the excess inflation approach is Feldstein and Taylor (1977). An example of the residual approach is Davis (1974). Examples of the specific illness and specific technology approaches are Scitovsky (1967, 1985). Lee (1991) and Project HOPE (1989) are examples of the specific technology approach.

This year, 61 specialty societies responded to the Commission's request to identify new technologies. They both updated their submissions from previous years and provided additional information on new technologies or techniques. The societies also noted instances in which a CPT code for an older technology was also being used to bill for a new technology.

Most organizations submitted short lists of technologies, procedures, and techniques whose frequency of use has or is expected to change. To the extent possible, the respondents listed the CPT codes for the services mentioned. Some organizations submitted practice guidelines which have been published or are currently in development (American Medical Association 1991, American Academy of Dermatology 1990). Others submitted statistical analyses of Medicare claims data (American College of Surgeons 1992). A number of the respondents mentioned other relevant work in progress, sent copies of articles on technological change, and identified contacts within their organizations who would be able to further assist the Commission. The material contained in these responses was used to develop estimates of the direct effect of the technologies identified on expenditure growth.

The Commission's analysis involved calculating historical rates of growth for all procedures and those procedures identified as not being in the new technology group.[3] The difference in these growth rates was then interpreted as representing the share of total growth directly attributable to the new technologies.

Based on the responses from specialty societies, approximately 700 procedures were identified as new or diffusing technologies. Approximately 14 percent of the annualized growth in volume between 1986 and 1990 was attributed to these new and diffusing technologies with the share being slightly higher between 1989 and 1990 (Table C-1). These estimates do not take into account the indirect effects of new technology use on existing technologies. Therefore, these estimates may understate the total impact of the new technologies.

In general, these technologies experienced significantly higher volume growth than other medical services. Non-laser endoscopies, other laser procedures, CAT scans, and doppler-based procedures were the largest contributors to the overall higher growth in volume for

---

[3] The primary data sources were the BMAD-I Procedure files for 1986 through 1990. Part B enrollee counts were obtained from the March 1991 Area Resource File.

Table C-1. Trends in New Technology Growth: 1986-1990

	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE 1990
PROCEDURE	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
ALL SERVICES	11.90	2.65	9.01	9.04	2.10	6.80	100.00
NEW TECHNOLOGIES	16.61	1.47	14.92	12.09	-0.81	13.00	16.24
Endoscopy-Not Laser	14.04	2.54	11.22	9.05	-0.50	9.60	3.19
Laser, Other	36.47	5.71	29.10	10.32	0.20	10.10	1.98
CAT Scans	11.49	-1.57	13.27	3.34	-6.90	11.00	1.89
Prosthesis, Joint	9.41	1.35	7.96	9.97	2.30	7.50	1.63
Endoscopy, Transurethral	4.73	2.42	2.26	1.60	0.10	1.50	1.56
Ultrasound	6.87	-3.05	10.23	10.86	-3.60	15.00	1.13
Doppler	38.16	2.53	34.75	31.84	2.60	28.50	1.07
MRI	61.47	-6.13	72.01	33.39	-5.60	41.30	0.76
Endoscopy, Laser	25.91	4.21	20.82	8.85	-4.60	14.10	0.66
Angioplasty-Coronary	34.86	3.58	30.19	28.56	5.90	21.40	0.63
Mammography	27.49	-1.10	28.90	15.85	-3.30	19.80	0.49
Arthroscopy	25.72	2.45	22.71	13.95	-6.90	22.40	0.26
EEG	10.88	3.97	6.65	5.57	3.20	2.30	0.11
Prosthesis, Genital	8.65	4.81	3.67	8.93	-3.60	13.00	0.11
Electromyography	13.53	5.72	7.38	11.72	5.40	6.00	0.10
Radioisotopes, New	14.45	4.26	9.78	9.19	-2.60	12.10	0.10
Lithotripsy-ESWL	27.36	6.22	19.90	7.28	-3.00	10.60	0.08
Prostatic Specific Antigen	.	.	.	83.44	-5.20	93.50	0.08
Angioplasty-Other	84.20	-0.43	84.99	17.49	-1.10	18.80	0.07
Organ Transplant	1.46	4.45	-2.87	11.03	-2.00	13.30	0.06
Implantable Infusion Pump	68.48	0.43	67.76	98.93	4.70	90.00	0.05
Urodynamic Studies	23.94	3.21	20.08	28.17	6.90	19.90	0.05
Small Tube Thoraces	10.32	5.41	4.65	6.54	0.70	5.80	0.04
Angioplasty-Intraoperative	575.76	13.20	496.96	5.39	9.90	-4.10	0.02
Implantable Defibrillator	275.89	0.01	275.84	39.17	9.50	27.10	0.02
Percutaneous Diskectomy	55.16	-0.82	56.44	24.31	2.40	21.40	0.02
Flow Cytometry	295.52	13.58	248.22	234.23	-2.70	243.50	0.01
Inhalation/Provocational	27.94	5.51	21.25	34.69	12.90	19.30	0.01
Lithotripsy-Percutaneous	-8.41	5.53	-13.21	-4.72	6.70	-10.70	0.01
Myocardial Biopsy	25.95	5.33	19.57	27.39	-1.40	29.20	0.01
Pulse Oximetry	197.90	5.38	182.68	169.97	7.60	150.90	0.01
Skin Graft, Microsurgical	37.37	5.91	29.71	24.21	11.00	11.90	0.01
Thrombolytic Therapy	180.79	-4.83	195.03	92.57	5.00	83.40	0.01
X-Ray Absorbiometry	4.29	-3.56	8.13	-2.05	-8.20	6.70	0.01
Bone Growth Stimulator	32.49	7.53	23.21	37.79	-1.30	39.60	0.00
Cochlear Implant	123.23	6.81	108.98	72.01	1.30	69.80	0.00
DNA Test for Gene Disorder	3.01	3.05	-0.04	-6.94	1.70	-8.50	0.00
Intra-Arterial Fibrinolysis	.	.	.	196.79	0.30	195.90	0.00
OTHER MEDICAL SERVICES	10.99	2.88	7.88	8.45	2.70	5.60	83.74

Source: PPRC analysis of the BMAD-I for 1986 through 1990.
Notes: (.) - indicates that statistic could not be calculated.

new technology procedures.[4] Coronary angioplasties, mammographies, arthroscopies, and MRIs also contributed, albeit to a lesser extent. Other technologies (e.g., intra-angioplasty, flow cytometry, implantable defibrillators, pulse oximetry, and thrombolytic therapy) had higher volume growth rates. Their relatively small expenditure share, however, minimized their contribution to overall trends.

Some of the technologies identified in this year's survey were so recently introduced that no evidence of their utilization was found.[5] Other recent technologies could not be identified though CPT codes.[6] The impacts of these technologies, though, should become more measurable in the coming years.

This analysis has allowed the Commission to begin to monitor a sizable number of new technologies. It does not, however, give a definitive estimate of the impact of technological change on expenditures. New technologies that were not identified by specialty societies were not included in these estimates. In addition, the effects of new technologies on existing procedure utilization were not estimated. This includes both increases in complementary procedures and reductions in substitute procedures. Moreover, the analysis does not account for new applications of well-established technologies. Developing methods to measure the multiple effects of technology will continue to be a key element of the Commission's work on the VPS.

THE COMMISSION'S RESEARCH AGENDA FOR MEASURING TECHNOLOGICAL CHANGE EFFECTS

The adoption and diffusion of medical technology, and its impact on expenditures, do not easily lend themselves to precise measurement. The Commission, however, believes that improvements can be made to empirically based estimates of technological impacts. The estimates developed thus far by the Commission were based on an approach that fails to account for all of the direct and indirect effects of technological change. During the coming year the Commission will investigate some of the areas where improvements can be made. The Commission hopes to gain a better understanding of the process by which technology is integrated into medical practice and the resulting impact on expenditures. Even if precise measurement of the impact remains elusive, decisions affecting the VPS will benefit from a clearer understanding of how technological innovation affects service utilization and costs.

---

[4] Other laser procedures included laser surgery for tumor and lesion destruction, photocoagulation, lens laser surgery, and trabeculoplasty by laser surgery, for example. In total, 19 procedures were included in this group.

[5] These technologies included, for example, gamma knives and prostate balloon dilation.

[6] For example, a CPT code does not yet exist for positron emission tomography (PET). Laparoscopic cholecystectomy, a frequently cited example of new medical technology, was only assigned a unique CPT code in 1992.

More Intensive Assessments of Complementary/Substitute Technologies

Distinguishing between substitute and complementary procedures is important for obtaining estimates of the net effects of new technologies.[7] As noted above, attempts at drawing such distinctions have been less than completely successful. There are two possible explanations for this. First, the hypothesized substitutions may not exist. The new and existing technologies may be sufficiently different in capabilities or applications that the degree of substitution is truly small. Second, data limitations have constrained the ability of these efforts to identify properly the situations where substitutions should occur. The underlying condition of the patient and various other characteristics are important determinants.

Commission staff intend to explore this issue further. As a starting point, a set of new technology procedures and existing procedures will be identified. Data for these procedures from HCFA's National Claim History (NCH) System, the successor to the BMAD series, will then be analyzed to identify changes in technology use for given episodes of illness. In addition to the claim information on the BMAD files, the NCH system will contain diagnosis code, and other important control variables that make this analysis possible.[8] These additional control variables may permit more accurate identification of instances where substitutions should exist or occur.

Diffusion of Technology

Understanding the process by which technologies diffuse, the factors that influence diffusion, and their effects on spending for medical care will be a focus of the Commission's analysis next year. Tracking the changing uses of technology requires that diffusion be clearly defined, and that is where the Commission's work will start. The analytic work will then focus on the interactions of factors affecting diffusion, criteria for identifying stages in the diffusion cycle, and tracking adaptations of established technologies.

Factors Affecting Technology Diffusion. Preliminary analysis of trends in the use of the set of new technologies identified by specialty societies reveals considerable variation in growth rates by specialty and diffusion across geographic areas (Tables C-2 and C-3). The

---

[7] Net effects are defined as differences in cost of treatment between the new and existing technologies, holding outcomes constant.

[8] At present, the diagnosis code fields suffer from possible coding inaccuracies. Over time, the quality of this field is likely to improve.

Commission's work will focus on identifying the factors affecting these patterns such as distribution of specialists, the diffusion and adaptation cycles for different types of technologies, the impact of payment policy, the organization of care, and the availability of local medical resources.

Table C-2. Trends in New Technology Growth: By Physician Specialty, 1986-1990

	AVERAGE ANNUAL PERCENTAGE CHANGE 1986-1989			PERCENTAGE CHANGE 1989-1990			PERCENT SHARE 1990
PHYSICIAN SPECIALTY	Outlays	Prices	Volume	Outlays	Prices	Volume	Outlays
Radiology	19.12	-1.35	20.76	13.24	-5.00	19.20	22.03
Ophthalmology	25.10	1.63	23.09	8.47	-1.30	9.90	13.72
Urology	8.21	2.99	5.07	7.28	-0.30	7.60	11.77
Orthopedic Surgery	11.75	1.54	10.05	11.36	0.60	10.70	11.17
Gastroenterology	25.12	2.88	21.62	12.99	-2.00	15.30	10.65
Internal Medicine	11.75	3.17	8.32	6.69	-0.20	6.90	7.10
Cardiovascular Disease	39.14	2.93	35.18	37.68	4.70	31.50	5.89
General Surgery	16.52	3.66	12.41	11.67	-2.30	14.30	4.41
Clinic or Group Practice	10.23	0.02	10.21	0.95	2.70	-1.70	3.91
Family Practice/GP	13.66	2.38	11.02	10.16	-0.40	10.60	1.43
Neurology	13.68	2.85	10.53	7.76	0.80	6.90	1.38
Thoracic Surgery	21.17	3.79	16.75	9.27	0.90	8.30	1.15
Pulmonary Disease	17.67	2.95	14.30	15.97	2.00	13.70	1.09
All Others	26.32	1.67	24.71	26.30	1.03	25.34	4.32
TOTAL	**18.20**	**1.54**	**16.46**	**11.95**	**-1.16**	**13.32**	**100.00**

Source: PPRC analysis of BMAD-I data for 1986 through 1990.

Notes: Data are for Part B carriers judged to have reported data consistently over this time period. These carriers accounted for 55.4 percent of all expenditures over this time period.

Changes in the Use of Diffusing Technologies. One aspect of technology diffusion is identifying different applications for the technology. As technologies become more widely used, new applications are found. To some degree, this applies to established technologies as well as new ones.

Commission staff will explore changes in technology applications. This exploration will involve a combination of qualitative and quantitative analyses. The qualitative analysis will consist of such activities as collecting information from specialty societies, reviewing program material from professional meetings, and conducting a literature review to obtain information on new applications of existing technologies. The quantitative analysis will involve examining Medicare claims data for changes in the diagnoses for which certain procedures are used. The procedures selected for this analysis will be based on the information gathered in the qualitative analysis.

Table C-3. Trends in New Technologies: Number of MRIs per Thousand Enrollees, by State, 1986-1990

STATE	1986	1987	1988	1989	1990
Alabama	5.05	11.37	15.84	19.80	26.26
Alaska	10.94	11.76	19.51	31.44	32.09
Arizona	7.70	12.94	18.38	23.47	31.78
Arkansas	2.10	6.16	11.65	17.57	23.44
California	7.75	15.82	22.22	26.86	37.80
Colorado	.	6.37	15.10	18.57	26.66
Connecticut	0.66	1.51	4.76	12.38	20.32
Delaware	3.14	10.80	18.14	28.22	35.02
District of Columbia	8.51	18.90	29.66	48.74	60.58
Florida	.	9.14	18.13	27.35	36.42
Georgia	2.27	4.83	10.62	17.78	25.38
Hawaii	0.48	2.00	3.25	3.07	3.11
Idaho	9.13	15.97	22.49	41.33	45.71
Illinois	.	6.36	12.13	16.97	19.57
Indiana	.	6.27	11.19	17.60	24.63
Iowa	1.74	5.85	10.19	13.92	18.00
Kansas	0.07	6.67	14.76	12.94	24.52
Kentucky	1.22	5.14	9.00	11.64	17.85
Louisiana	3.47	9.38	14.79	23.51	30.19
Maine	0.50	6.05	9.72	8.46	12.40
Maryland	4.18	8.88	15.51	18.24	27.03
Massachusetts	0.38	5.36	12.39	13.55	21.72
Michigan	0.87	2.18	4.97	10.27	16.48
Minnesota	2.25	3.86	7.50	13.36	20.57
Mississippi	0.23	4.20	8.41	10.34	18.80
Missouri	3.71	7.01	11.14	13.33	17.60
Montana	0.00	1.77	12.85	22.09	24.17
Nebraska	1.34	3.02	5.51	7.97	14.63
Nevada	4.45	8.71	17.59	33.82	38.87
New Hampshire/Vermont	0.01	2.14	7.58	10.80	12.62
New Jersey	3.79	7.39	12.11	20.50	24.76
New Mexico	3.55	7.99	14.48	22.06	22.77
New York	3.24	7.34	10.37	12.37	19.36
North Carolina	1.31	3.20	7.61	14.31	20.30
North/South Dakota	0.00	1.21	6.32	10.68	16.81
Ohio	1.72	4.62	10.43	15.98	21.45
Oklahoma	2.79	6.35	9.87	13.73	18.74
Oregon	6.43	10.77	16.60	20.13	24.16
Pennsylvania	3.66	9.63	13.37	26.19	31.88
Rhode Island	0.00	0.00	0.38	N/A	15.00
South Carolina	0.36	2.48	6.82	10.73	18.42
Tennessee	5.29	11.41	21.77	30.41	39.65
Texas	2.18	7.59	13.64	22.22	31.14
Utah	2.50	17.59	12.65	15.81	22.04
Virginia	1.09	5.45	9.45	13.46	19.06
Washington	3.99	10.35	14.64	18.60	23.43
West Virginia	0.57	3.13	8.99	13.46	18.84
Wisconsin	1.28	2.57	11.34	14.78	19.34
Wyoming	0.00	0.09	10.53	23.74	23.55
TOTAL	**3.24**	**7.68**	**13.09**	**18.67**	25.07

Source: PPRC analysis of the BMAD-I for 1986 through 1990.

Notes: N/A - denotes instances where states did not submit data.

(.) - denotes instances where data were excluded from the analysis due to incomplete submissions or coding inconsistencies.

Refining the Scope of New Technologies - When is a Technology No Longer New? The distinction between new and diffusing technologies and established ones is somewhat vague. This is complicated by the fact that diffusion rates differ by physician specialty, geographic location, and most likely by the characteristics of the technology itself.

CAT scans provide a good illustration of a technology that is not new to medical care but is still diffusing in terms of new applications and geographic areas. CAT scans were first introduced in the United States in 1973 (Deber et al. 1988). The number of CAT scans per 1,000 enrollees, however, is increasing at rates comparable to other, newer technologies. Between 1986 and 1990, the number of CAT scans per 1,000 enrollees increased at an average annual rate of 6.8 percent (Table C-4). This is faster than the 4.9 percent average annual growth rate for endoscopies (Table C-5). Over the last several years, the Commission has spent considerable effort in identifying new and diffusing technologies. In the future it will become increasingly important to develop a consistent set of criteria to identify those technologies that are both established and not being used for new applications as well as monitoring those that are emerging or continue to diffuse.

Each year the Prospective Payment Assessment Commission (ProPAC) estimates the effects of new technologies for the scientific and technological advancement factor (S&TA) of the discretionary adjustment factor (DAF) for Medicare hospital payment. The technologies included in these annual analyses have to be between 5 and 75 percent diffused (Project HOPE 1989). Diffusion is measured by the proportion of hospitals that report at least one use of the technology.

The applicability of this type of criterion for Part B services is not clear. A physician community, defined in geographic and/or specialty terms may not possess the same institutional knowledge as a hospital. Therefore, a much higher utilization rate may be required before a technology is deemed diffused.

Over the next year, Commission staff intend to explore alternative criteria for fully diffused technologies. The results of this exploration may be incorporated into future VPS analyses.

Analysis of Impacts of Drug Innovations on Medicare Service Use

One limitation of any study of the effects of technological change on Medicare costs is the omission of the impacts of non-Medicare covered innovations. A major source of these innovations is non-covered drugs. Each year 10 percent of the 200 largest selling drugs are new. Further, only about 25 percent of the 200 top selling drugs in 1972 remained in this group in 1987 (Weisbrod 1991).

Table C-4. Trends in New Technologies: Number of CAT Scans per Thousand Enrollees, by State, 1986-1990

STATE	1986	1987	1988	1989	1990
Alabama	117.92	145.33	172.91	163.16	193.46
Alaska	95.79	103.82	109.69	107.18	112.89
Arizona	113.60	127.73	137.85	146.24	150.17
Arkansas	110.88	131.46	136.02	141.27	156.27
California	110.66	115.45	119.51	120.83	121.64
Colorado	.	104.71	111.94	116.74	123.58
Connecticut	114.18	135.10	147.30	167.09	168.38
Delaware	120.44	136.90	156.80	172.70	190.84
District of Columbia	198.70	225.58	237.83	270.53	297.40
Florida	.	132.93	163.01	172.59	183.87
Georgia	138.34	160.37	183.97	187.96	201.09
Hawaii	80.95	78.23	81.31	85.17	96.06
Idaho	78.37	89.40	96.68	101.55	110.72
Illinois	.	132.85	139.03	147.04	143.99
Indiana	.	140.84	151.61	177.06	191.48
Iowa	101.86	111.99	118.12	116.61	121.97
Kansas	105.34	127.41	154.61	184.00	209.47
Kentucky	107.64	139.11	166.82	180.43	197.23
Louisiana	135.39	161.93	183.41	193.30	205.64
Maine	103.62	113.84	122.79	110.64	129.26
Maryland	151.15	168.36	178.19	205.38	212.51
Massachusetts	133.60	147.30	160.59	142.45	174.25
Michigan	130.48	160.25	177.46	188.42	202.37
Minnesota	66.57	67.72	79.08	104.66	130.39
Mississippi	113.93	129.06	145.73	153.47	161.53
Missouri	120.65	131.28	141.24	151.61	167.83
Montana	80.45	91.96	98.75	108.12	108.74
Nebraska	77.25	77.62	81.71	107.25	127.28
Nevada	120.88	139.50	154.10	209.12	178.96
New Hampshire/Vermont	92.42	105.84	116.84	116.88	130.52
New Jersey	128.03	149.74	163.02	190.24	206.63
New Mexico	74.52	84.47	98.67	99.88	104.77
New York	108.35	126.92	139.23	153.43	166.14
North Carolina	101.38	116.98	126.12	147.99	159.42
North/South Dakota	50.24	131.81	145.47	157.43	172.67
Ohio	153.54	165.82	168.36	172.11	176.49
Oklahoma	92.79	110.42	130.94	139.60	147.74
Oregon	83.90	89.02	93.63	98.49	100.50
Pennsylvania	157.43	176.75	162.19	204.12	217.09
Rhode Island	133.28	142.17	161.18	N/A	185.16
South Carolina	90.19	103.99	125.81	134.04	148.41
Tennessee	153.27	172.51	189.38	201.48	215.68
Texas	125.82	152.20	165.24	172.80	183.72
Utah	93.04	105.52	104.07	109.71	110.23
Virginia	119.06	133.68	150.05	162.98	178.39
Washington	106.55	116.42	122.59	129.10	137.16
West Virginia	109.65	126.01	130.19	127.57	144.66
Wisconsin	131.36	130.99	154.48	145.97	157.73
Wyoming	69.09	87.49	97.20	102.79	104.03
TOTAL	**129.81**	**135.79**	**147.18**	**157.76**	**168.85**

Source: PPRC analysis of the BMAD-I for 1986 through 1990.

Notes: N/A - denotes instances where states did not submit data.

(.) - denotes instances where data were excluded from the analysis due to incomplete submissions or coding inconsistencies.

Table C-5. Trends in New Technologies: Number of Endoscopies per Thousand Enrollees, by State, 1986-1990

STATE	1986	1987	1988	1989	1990
Alabama	158.71	172.15	184.14	184.65	195.60
Alaska	108.22	109.70	110.09	119.73	122.98
Arizona	139.41	151.60	166.77	169.98	176.19
Arkansas	150.21	162.16	170.50	175.63	187.88
California	145.51	150.73	155.04	158.75	162.30
Colorado	.	140.93	144.52	154.55	164.34
Connecticut	155.29	137.12	177.72	184.06	191.29
Delaware	166.13	181.01	196.50	231.23	239.49
District of Columbia	221.71	236.32	250.54	267.96	297.88
Florida	.	199.24	207.45	216.30	228.12
Georgia	155.23	169.34	157.53	173.91	186.85
Hawaii	129.42	107.78	115.15	121.90	126.68
Idaho	113.27	119.14	125.77	125.58	131.05
Illinois	113.58	126.95	134.17	141.75	140.84
Indiana	.	143.74	153.36	167.64	167.12
Iowa	121.65	134.26	140.20	145.68	146.15
Kansas	140.48	164.84	179.66	187.06	200.67
Kentucky	118.12	131.23	143.34	151.37	165.04
Louisiana	167.89	189.81	201.09	208.13	217.19
Maine	131.51	145.47	152.31	153.26	155.49
Maryland	162.66	167.43	176.72	184.82	205.41
Massachusetts	128.71	133.08	140.72	144.87	151.03
Michigan	177.76	185.36	194.61	200.77	210.64
Minnesota	94.09	94.22	105.11	137.04	165.52
Mississippi	128.11	137.48	153.28	157.77	166.89
Missouri	136.36	145.36	149.19	161.76	166.14
Montana	133.83	153.37	156.97	151.30	155.20
Nebraska	126.17	142.05	122.53	140.60	161.17
Nevada	119.28	131.54	144.32	184.46	160.30
New Hampshire/Vermont	114.95	125.90	134.44	139.72	145.77
New Jersey	155.02	166.83	173.80	177.02	185.33
New Mexico	106.85	108.21	126.17	129.15	130.44
New York	152.48	156.02	171.45	176.00	183.75
North Carolina	146.18	160.13	160.12	170.47	182.46
North/South Dakota	155.35	166.76	174.92	178.35	177.08
Ohio	146.93	163.68	173.39	175.13	179.10
Oklahoma	126.36	143.95	155.58	161.27	172.18
Oregon	136.86	133.21	133.38	138.92	143.71
Pennsylvania	159.10	172.83	151.86	193.68	198.81
Rhode Island	134.90	137.41	153.22	N/A	166.22
South Carolina	122.89	134.54	155.99	156.13	181.09
Tennessee	151.52	150.30	178.95	188.95	198.17
Texas	142.78	160.76	167.47	176.48	187.48
Utah	146.07	155.30	165.34	161.85	167.56
Virginia	123.50	122.46	144.35	152.96	166.20
Washington	148.64	159.85	163.28	164.31	165.12
West Virginia	112.14	122.89	128.49	133.36	145.13
Wisconsin	149.26	161.21	162.75	173.09	181.33
Wyoming	106.83	106.15	118.41	119.01	120.71
TOTAL	**144.83**	**155.81**	**163.00**	**169.58**	**175.08**

Source: PPRC analysis of the BMAD-I for 1986 through 1990.

Notes: N/A - denotes where states did not submit data.

(.) - indicates states that were excluded from the analysis due to inconsistent or incomplete data submissions.

Thrombolytic drugs are a good example of this interrelationship in the use of covered and non-covered services (Garrison and Brown 1991). These drugs increase patient survival rates and, hence, their subsequent use of Medicare covered services. Alternatively, there are drugs that reduce utilization of Medicare services. For example, ursodeoxycholic acid is a drug that dissolves cholesterol gallstones. Patients taking this drug would not have to undergo surgery for gallstone removal.

During the coming year Commission staff will explore the feasibility of obtaining quantifiable estimates of these interrelationships. A promising data source for this purpose is HCFA's Current Beneficiary Survey (CBS). This survey will permit the linkage of non-covered service data and Part B claims data. HCFA anticipates that the first round of data from the CBS may be available by September 1992.

Trends in Technology Assessment

In the past, some technologies have been adopted in the absence of consistent proof of efficacy (Siegel 1987). The extent to which greater assessment is conducted before technologies are made widely available may slow the diffusion process and resulting expenditure growth.

Traditional medical technology assessment has focused on the medical effectiveness of a procedure or device. More recently, this work has expanded to include cost-effectiveness and benefit-cost analysis (Fuchs and Garber 1990).

Prior to the advent of the Medicare prospective payment system (PPS) for hospitals in 1983, institutions serving Medicare beneficiaries did not face strong financial incentives to assess technologies in terms of cost-effectiveness prior to adoption (Weisbrod 1991). Since PPS, these incentives have shifted toward the adoption of cost-reducing technologies (Lee and Waldman 1985). In addition, evidence indicates a slowing down in diffusion rates under prospective payment (Romero et al. 1984).[9]

There is some anecdotal evidence that increasing interest is being paid to technology assessment for physicians' services. The introduction of medical technology assessment as an analytical framework occurred in the early 1970s (Banta and Thacker 1990). By 1989, there were 67 technology assessment groups in the United States (Hamilton et al. 1989).

Discussions with specialty societies confirm the growing awareness and use of technology assessment. The question, though, is to what extent this trend will affect the rate of introduction and diffusion of new technologies. If the experience of technology assessment for inpatient facilities carries over to physicians' services, the share of expenditure growth attributable to new technologies should remain constant or possibly even decline in the future.

---

[9] It is not certain, however, how much of this trend is directly attributable to technology assessment.

Commission staff will examine trends in technology assessment. This examination will include identifying the types of assessment being performed (e.g., safety and efficacy versus cost effectiveness), growth in the use of assessments, and the impact of assessments on technology adoption and diffusion.

REFERENCES

Altman, S.H. and S.S Wallack, "Is Medical Technology the Culprit Behind Rising Health Costs? The Case For and Against," in Altman, S.A., and R. Blendon (eds), *Medical Technology: The Culprit Behind Health Care Costs?*, pp. 24-37 (Washington DC: DHEW Publication No (PHS) 79-3216, 1979).

American Academy of Dermatology, *Guidelines of Care for Alopecia Areata* (Evanston IL: American Academy of Dermatology, February 1990).

American College of Surgeons, *1992 Medicare Volume and Technology Assessment Survey for Surgical Services* (Chicago: American College of Surgeons, March 1992).

American Medical Association, *Directory of Practice Parameters, 1992 Edition* (Chicago: American Medical Association, 1991).

Banta, H.D., and S.B. Thacker, "The Case for Reassessment of Health Care Technology: Once is Not Enough," *Journal of the American Medical Association*, 264(2):235-240, July 11, 1990.

Bernardin, M., and J.A. Schoenman, *Analysis of Inappropriate Utilization and Lack of Access for the Purpose of Determining the Medicare Volume Performance Standards*, Final Report prepared under Cooperative Agreement No. 99-C-99168/3-03 for the Health Care Financing Administration (Chevy Chase, MD: Project HOPE Center for Health Affairs, 1991).

Borbas, C., *The Minnesota Clinical Comparison and Assessment Program: A Program to Influence Clinical Decision-Making through Integration of Practice Guidelines, Data Collection and Feedback*, paper presented to the American Medical Association, November 5, 1991.

Boutwell, R.C., and J.B. Mitchell, *Diffusion of New Technologies in the Medicare Population: Implications for Patient Access and Program Expenditures*, unpublished paper (Waltham, MA: Center for Health Economics Research, 1991).

Brook, R.H., et al., *Appropriateness of Acute Medical Care for the Elderly: An Analysis of the Literature*, Report No. R-3717-AARP/HF/RWJ/RC (Santa Monica, CA: The RAND Corporation, September 1989).

Davis, K., "The Role of Technology, Demand and Labour Markets in the Determination of Hospital Cost," in Perlman, M. (ed.), *The Economics of Health and Medical Care*, pp. 283-301 (London: Macmillan, 1974).

Deber, R.B., G.G. Thompson, and P. Leatt, "Technology Acquisition in Canada," *International Journal of Technology Assessment in Health Care*, 4:185-206, 1988.

DuBois, R.W., "Reducing Unnecessary Care: Different Approaches to the 'Big Ticket' and the 'Little Ticket' Items," *Journal of Ambulatory Care Management*, 14(4):30-37, 1991.

Eisenberg, J.M., et al., "Substituting Diagnostic Services: New Tests only Partly Replace Older Ones," *Journal of the American Medical Association*, 262:1196-1200, 1989.

Feldstein, M.S., and A. Taylor, *The Rapid Rise of Hospital Costs*, GPO Stock No. 052-003-003.03.1 (Washington, DC: U.S. Government Printing Office, 1977).

Fuchs, V.R., and A.M. Garber, "The New Technology Assessment," *New England Journal of Medicine* 323(10):673-677, 1990.

Garrison, L.P., and D.M. Brown, *Assessing the Impact of Changes in Technology on Medicare Expenditures for Physician Services: Background, Issues, and Options*, Final Report prepared under Cooperative Agreement No. 99-C-99168/3-03 for the Health Care Financing Administration (Chevy Chase, MD: Project HOPE Center for Health Affairs, 1991).

Greer, A.L., "The State of the Art Versus the State of the Science: The Diffusion of New Medical Technologies into Practice," *International Journal of Technology Assessment in Health Care* 4:5-26, 1988.

Hamilton, J.C., E.T. Smith, and S. Garland, "High-Tech Health Care: Who will Pay?," *Business Week* 75-78, February 6, 1989.

Lee, D.W., "Estimating the Cost of New Technology on Medicare Program Outlays: Do Related Procedures Matter?," draft paper, American Medical Association, Center for Health Policy Research, March 18, 1991.

Lee, R.H., and D.M. Waldman, "The Diffusion of Innovation in Hospitals," *Journal of Health Economics*, 4(4):373-80, December 1985.

Office of Technology Assessment, *Medical Technology and Costs of the Medicare Program*, Report OTA-H-227 (Washington, DC: U.S. Government Printing Office, July 1984).

Park, R.E., et al., "Physician Ratings of Appropriate Indications for Six Medical and Surgical Procedures," *American Journal of Public Health*, 76(7):766-772, July, 1986.

Physician Payment Review Commission, *Annual Report to Congress 1990* (Washington, DC: PPRC, 1990a).

Physician Payment Review Commission, *Medicare Volume Performance Standard Rate of Increase for Fiscal Year 1991* (Washington, DC: PPRC, 1990b).

Physician Payment Review Commission, *Annual Report to Congress 1991* (Washington, DC: PPRC, 1991a).

Physician Payment Review Commission, *Fee Update and Medicare Volume Performance Standards for 1992* (Washington, DC: PPRC, 1991b).

Physician Payment Review Commission, *Annual Report to Congress 1992* (Washington, DC: PPRC, 1992a).

Physician Payment Review Commission, *Monitoring Access: The Commission's Report to Congress* (Washington, DC: PPRC, 1992b).

Project HOPE, *Estimating the Contribution of Scientific and Technological Advancement to Medicare Inpatient Hospital Costs for Fiscal Year 1990*, report prepared for the Prospective Payment Assessment Commission under Contract No. T-4750329 (Chevy Chase, MD: Project HOPE Center for Health Affairs, 1989).

Rice, T., "Physician Induced Demand for Medical Care: New Evidence from the Medicare Program," *Advances in Health Economics and Health Services Research* 5:129-160, 1984.

Romero, A.A., J.L. Wagner, and R.H. Lee, "Prospective Reimbursement and the Diffusion of New Technologies in Hospitals," *Journal of Health Economics* 3(1):11-24, April 1984.

Scitovsky, A.A., "Changes in the Costs of Treatment of Selected Illnesses, 1951-1965," *American Economic Review* 57: 1182-1195, 1967.

Scitovsky, A.A., "Changes in the Costs of Treatment of Selected Illnesses, 1971-1981," *Medical Care* 23:1345-1357, 1985.

Siegel, D.M., "The High Cost of Medical Technology: Getting at the Heart of the Matter," *Medical Care* 25(10):979-87, October 1987.

Smith, J.L., "Cost/Benefits of High-Tech Medicine," *Health Systems Review* 16-17, January/February, 1992.

Sullivan, L.W., Letter to the Honorable Dan Quayle submitting recommendations on the FY 1991 MVPS, April 18, 1990.

Thomas, L., "On the Science and Technology of Medicine," *Daedalus*, 299-316, Summer 1977.

U.S. Congress, *Omnibus Budget Reconciliation Act of 1990* (Washington, DC: U.S. Government Printing Office, October 27, 1990).

U.S. Department of Health and Human Services, "Medicare Program: Definition of Surgical Services," *Federal Register*, 55(86):18668-18772, May 3, 1990.

Weisbrod, B.A., "The Health Care Quadrilemma: An Essay on Technological Change, Insurance, Quality of Care, and Cost Containment," *Journal of Economic Literature* 29:523-552, June, 1991.

1992 PPRC 1992 PPRC 1992 PPRC

CMS LIBRARY
3 8095 00012808 8

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC

1992 PPRC 1992 PPRC 1992 PPRC